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STATE LIBRARY.

Extract from the Political Code.

SECTION 2296. Books may be taken from the Library by the MEMBERS OF THE LEGISLATURE, DURING THE SESSIONS THEREOF, and by other State officers at any time.

SEC. 2298. The Controller, if notified by the Librarian that any officer has failed to return books taken by him within the time prescribed by the Rules, and after demand made, must not draw his warrant for the salary of such officer until the return is made, or three times the value of the books, or of any injuries thereto, has been paid to the Librarian.

SEC. 2299. Every person who injures or fails to return any book taken is liable to the Librarian in three times the value thereof.

No person shall take or detain from the General Library more than two volumes at any one time, or for a longer period than two weeks. BOOKS OF REFERENCE SHALL NOT BE TAKEN FROM THE LIBRARY AT ANY TIME.—[Extract from the Rules.]

☞The foregoing Regulations will be strictly enforced.☜

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JANUARY 7, 1882.

VOLUME XLIV. Number 1.

New Mechanics' Society.

Several mechanics and apprentices held a preliminary meeting last Tuesday evening at the Nautical School, for the purpose of forming a mechanics' society similar to the well-known institutions of Leeds and Manchester. The main object will be the diffusion of useful knowledge pertaining to mechanics, which it is proposed to be carried out by the establishment of courses of lectures, and especially by the formation of classes of instruction in mechanics and allied studies.

The name decided upon at this preliminary meeting is the Pacific Coast Mechanics' Educational Association. A committee of three, consisting of Messrs. Arvidson, Hillman and Williamson, was appointed to draw up a constitution and by-laws and report on Friday evening. A class of 15 in elementary algebra has already been formed. Capt. E. McNevin was appointed President; Daniel Suter, Secretary; and Robert Moore, Treasurer.

At the first meeting, the matter was pretty thoroughly discussed by those present, and there was some question as to whether an association or only a class should be formed. When put to vote, it was decided to form an association.

It is proposed to meet on Tuesday and Friday evening of each week for class instruction, and on Thursday evening to attend the lecture. The first thing proposed is to teach the members something of mathematics, to give them a ground-work to enable them to understand mechanical problems. It is proposed also to have drafting classes as they go on.

A few weeks' time will determine whether there is a necessity for the classes, as such, to be carried on. It may be that some more general system of instruction will be found to work better.

This move is one which ought to have been undertaken long ago by the Mechanics' Institute of this city. This institution failing to do so, however, these young men have taken the bull by the horns and have started in for themselves. The membership fee will be only 50 cents per month. This is only a small beginning, it is true, but it shows the right spirit among those young men who take upon themselves the task.

It is as well for young mechanics and apprentices to consider in this connection, whether it would not greatly please their employers to find them joining such classes. We feel assured that it would, and that it would be beneficial to them in many ways. The difference between a workman who knows how to do it without knowing why, and one who knows how to do it and also why, is always recognized; and the latter will most probably end by simply telling how, and not having to do it himself, while the other will always have the hard work; as it always pays better to be the director than the operator.

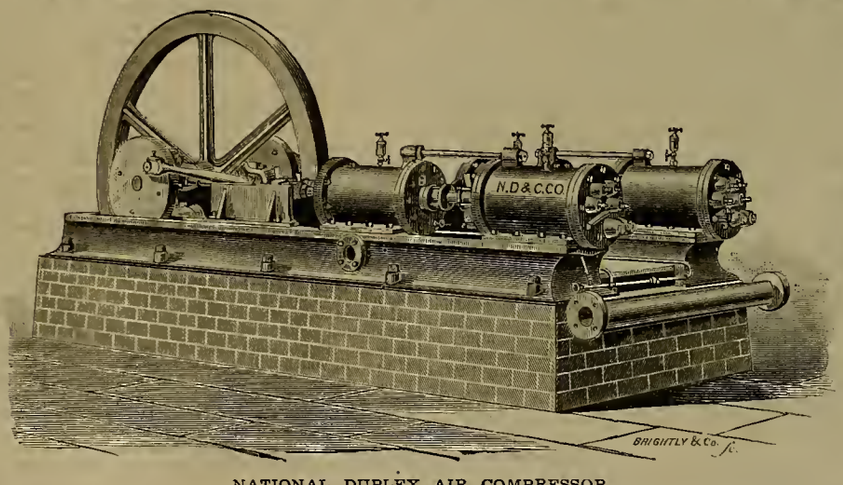
The St. Gothard tunnel is now open for traffic. The weak part under Andermatt, which has broken so often, is now thought to be permanently and securely protected against collapse. It is now proposed to connect the Adriatic with the Lago Maggiore by a system of canals, of which the termini will be at Venice and Maradino. This project presents neither financial nor engineering difficulties, and it will probably be actually accomplished.

The Christmas number of the Mining and Scientific Press, 32 pages, devotes considerable space to the mines and industries of Arizona, most of which is confined to Tombstone and the southern districts of the Territory. It has two illustrations of Yuma—one of the town and the other of the S. P. R. R. depot at that place. Of Prescott and the mining sections in Yavapai and Mohave counties it has the following to say: * * *—*Arizona Miner.*

The National Duplex Air Compressor.

The engraving on this page represents the latest improved air compressor manufactured by the National Compressor and Drill company, and for sale on this coast by Reynolds, Rix & Co., of this city. It is claimed that this machine will develop more power in proportion to cost and consumption of fuel than any other machine in the market. The size of cylinders on these machines range from 8x10 to 26x42 inches; larger sizes are made to order. The water circulation for cooling passes spirally around the air cylinder from the center to each end, keeping it perfectly cool without allowing the water to enter the cylinders. The air is thus always dry. The inlet and outlet valves can be removed without disturbing any of the other parts of the machine.

It will be noticed that there is an air compressor and steam cylinder on each side of the bed. A fly-wheel is mounted on the shaft common to both, making an evenly balanced machine. There are a number of these compressors in use on this coast. They have them in both the Empire and the Idaho mines, Nevada county, that at the latter mine being 18x36 in size.



NATIONAL DUPLEX AIR COMPRESSOR.

Employees of Mining Companies.—The Gould & Curry and Best & Belcher shaft employs a total of 68 men, Savage, 115, Hale & Norcross 59, Andes 10, Yellow Jacket 145, Imperial and Alpha 38, Kentuck 15, Overman and Caledonia 65, Forman shaft, 66, Alta 74; total in these mines, 657. The reporter has been unable to see Supt. Jones, and therefore the number of men employed in the Crown Point and Belcher have not been obtained. Of the number given above, 405 are employed in Gold Hill mines. Add to these the number employed in the Crown Point and Belcher, and the men at work on claims not listed in the San Francisco Stock Boards, the total number employed in Gold Hill district will not fall short of 750 men.

Col. Mendell, of the U. S. Engineers, says the Grass Valley *Union*, has appointed A. Larson, civil engineer at Dutch Flat, to take measurements and make estimates of the amount of ground that can be worked by the hydraulic process that has not been mined, on Bear and American rivers and their tributaries. In this manner an approximate estimate can be made of the amount of mining ground that can be hydrauliced and the time necessary to accomplish it.

The Carson and Colorado railroad will cause the making of mining discoveries and the development of mines in the region adjacent to it, which without its aid could not be made.

Burning Sulphur.

According to certain methods of burning sulphur, or material containing sulphur capable of being employed in the manufacture of sulphuric acid, a certain portion of sulphur is very liable to be volatilized. Henry Glover, of Silverton, Essex county, Eng., has devised an apparatus for effecting the entire combustion of the volatilized sulphur, and at the same time utilizing the heat that is produced from the entire combustion of the whole of the sulphur.

It consists in the employment of a mass of fire-brick work, or other suitable material, set pigeon-hole wise, or in any other convenient manner, between the burning plate of the furnace and the sulphuric acid chambers, or other apparatus, so as to form a reservoir of heat, in which heat may be conserved and any sublimed sulphur after admixture with the proper proportion of air to be burned. The air, previous to admission, may, if necessary, be heated by the waste heat of the burning sulphur, or by any other suitable means, and the quantity of air admitted may be measured by an anemometer, so as to secure the proper admixture of gases for any subsequent process.

By these arrangements a very high temperature is attained and at any convenient portion of the apparatus platinum or other vessels are placed in which sulphuric acid or other liquids are condensed. The details of the arrangement of the apparatus may be greatly varied, or produced without departing from the principle of the invention, which is in effect; the combination of the burning hearth of a furnace and the flues for the products of combustion with a reservoir, and pans adapted to be heated by said reservoir, and air supply conduits between the hearth and reservoirs.

The acting Attorney-General, on the 24th instant, in an opinion addressed to the President, and by him referred to the Department of the Interior, provides that when a mining claim on a lode has its inception prior to the location of a town site, and the mining claimant possessed and maintains the right of possession in accordance with other mineral land laws, no reservation in the patent for such mining claims should be inserted in favor of the town claimant or occupant. This opinion has been adopted.

Orders have been received to commence work upon the Wancoba District series of mines, Inyo county, belonging to the Waucoba mining company, of New York, of which Col. Hewston, of the Selby reduction works, of San Francisco, is President.

A bill to abolish the whipping-post has been introduced in the Legislature of Virginia by a colored Senator.

Foundry Notes.

New Pumping Engine.

The single pumping engine for the Idaho mine, Grass Valley, now nearing completion at the Union Iron Works, in this city, and being built under the supervision of Edward Coleman, President of the company, possesses several new features, noticeable among which are its simplicity and compactness. It is a 20x48-inch engine, with a 10-inch crank shaft 14 ft. long. The fly-wheel is 18 ft. in diameter. The pinion on the crank shaft is 34 inches in diameter, and is made with V teeth for strength and noiselessness. This pinion gears into the pump gear, which is 167 inches in diameter, 4½ pitch.

The gear shaft is 15 inches in diameter, and tapers to 11 inches, being 14 ft. long. The pitman rod is connected to the pump gear by a pin 7 inches long.

Instead of using the usual eccentric rods and rocker arms, a new design places a gear on the engine shaft, and runs a shaft geared to this, back lengthwise the engine, on which the eccentrics are placed, giving the motion to the valve and cut-off gear. This dispenses with large eccentrics and gets rid of a lot of rods and rocker arms.

On this engine is a plan of adjusting and regulating the bearing brasses by the use of horizontally inclined wedges and faces, with suitable actuating screws, all operating independently of the cap, which may thus be removed without disturbing the brasses or set of the shaft. In this device the side brasses have flanges projecting at right angles from the ends, so as to fit the sides of the pillow-block, and thus hold the brasses in place. The backs of the brasses are formed in with an incline face, extending from end to end of the brass between the flanges.

Wedges are fitted into the spaces behind the brasses, lying horizontally, and having holes formed in their ends with screw-threads to receive the horizontal screws, which, when turned, will cause the wedges to advance or recede. The shanks of the screws have collars which fit in spaces between the flanges of the brasses and a projection, so that, when turned, the screw will not advance or recede, but will move the wedge. Another method of doing this is, instead of forming screw-threads in the ends of the wedges, as above described, recesses may be made to receive nuts, which will operate in the same manner. These wedges may be made of considerable length, on account of the width of the box, and they will thus support the brass for so great a distance that it will be very rigid and will not twist or get out of place. The space for adjustment is much longer, and, finally, as the adjusting screws pass in through the sides and are independent of the cap, the latter may be removed for inspection or other purposes without touching these screws or in any way disturbing the position of the brasses or the set of the shaft, which might otherwise get out of place.

O'Neill's cut-off and valve motion and Mr. Scott's patent governor and pilow-block adjustment are used on this engine. This governor is arranged so as to be easily adjusted for the work the engine is to do.

This is an excellently designed pumping gear; everything is carefully figured out and executed. It will greatly add to the facilities of the mine.

The total number of tons of ore and tailings worked in Nevada for the twelve months commencing October 1, 1880, and ending September 30, 1881, was 452,728 and 1,667 pounds; gross yield, $9,505,971.41.

The Modoc furnaces at Lookout, Inyo county, are in active operation, under the management of Superintendent Thomas, putting out bullion worth from $600 to $700 per ton.

Four million one hundred and fifty thousand dollars has been expended this year in buildings in Denver, Colorado.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

The Debris Question.

The Supreme Court Ruling against the "Act to Promote Drainage"—Perhaps Entitled to Appeal.

EDITORS PRESS:—The ruling in Septembsr lsst (see your issue of Oct. 1st) of the Supresne Conrt against the act of April 23, 1880, to promote drainage, which had been endorsed by the Sacramento Snpsrior Court April 29, 1881, with all due deferencs, seems to have struck debatabls ground in sffirming that "it contravenes Section 24 of Article 4 of the Constitution, which requires that every act shall embrace hut ons subjsct, which shall be expressed in the title.' Such an objection, if deserved, would not only reflect npon ths wisdom and intelligence of ths lats Legislature, which includsd many able lswyers, hut also upon the intelligencs of the Govsrnor and the Attorney-General at his alhow to advise him that he could sign such a hill. It ssems impossibls that either of them could have committed such a glaring oversight as the Supreme Court makes them chargable with; and as such ruling tends to lessan the public respect for the legislative branches of the State with thoss who simply look at resnlts, and such conclusions may perhaps be altogether unwarrantable, some rectification and redress seems called for, in visw, also, of ths direct wishes and intendment of ths people through their representatives, having heen thus set at nanght. But the question occurs whether the Supreme Court did not, in common parlancs, "discover a mare's nest," and that ths Govsrnor made no oversight in not vetoing the hill instead of approving it? Had he vetoed it, he would havs stated his reasons therefor; but having on the contrary approved it, and the Supresne Court raised an unexpected and perhaps unwarrantable issus, it seems logical if the Governor, as ths executive of the people, could have an opportunity of presenting the whole matter to the Supreme Court of the United States, or snch authority as can take cognizancs of ths Supreme Court of the State exceeding its anthority, if in fact they havs done so, however unwittingly. It was self-evident to the people and their representatives, and should have been to the Supreme Court, that the drainage of the State of California, or of the Sscramento valley was a very comprehensivs matter, requiring the profoundsst thought and sciantific skill to plan the accomplishment thereof.

The necessity for that was acknowledged when the offics of the State Engineer was created by the State; and perhaps as far as possible, the most skillfnl examination was made by the Stats Engineer and his assistants, in conjunction, also, with Col. Mendell, and more recently Capt. Eads. It then hecams necessary to put in effect, at kast so much as the Legislature would grant permission for, ths requisits dsigns or plans of ths Enginser.

The bill of 1880 was drawn for that purposs. We had also gained the experience of the examination and conclusions of ths Sacramento Rivsr Drainage Commissioners, in communication with Col. Mendell, that a mere canal through Yolo and the Montezuma hills would not give the relief required. It was patent, thersfore, that the drainage of the Sacramsnto valley was a very hig thing, and "to promots it" had a very comprehsnsive meaning. Ths alrsady published reports of the Stats Engineer strennously advocated dams in the upper affluents of the Sacramento river, so that, probahly, 70% of flood and mining debris could he held back in the canyons, and so enahle ths semi-filtered water the bsttsr to scour the lower channels and ths bed of the Sacramento river. "An act to promote drainage," therefore, fully implied to ths Lsgislature and the people and the Govsrnor, such works as tended to its successful prosecution, just as much as an act to provids a railway, would comprise all requisite etations, bridges and other necessary works to that end. But the Supreme Court unfortunately seems to have failed to understand the magnitude of the operations necessary to promote drainage in the Sacramento valley, and consequently see no connection between drainage and the storage of debrie and general improvement of the river channels, etc., which they are pleased to term "a combination of subjects," "drainage being suhordinate;" and yet if they had thought for a moment upon the analogy of the curriculum of education, fiom A, B, C, or the acquisition of science or numeration to algebra, the primary fingering a musical instrument, the drudgery of the scales and exercicss, and necessary relation between mechanism and genius as regards music and composition, the laws of perspective and the finished work of art, and all the steps in chemistry or geology, hut especially the requisite acquirements of a civil engineer, all subordinated to the proper grasp of the project, then they might have understood that while the project was to promote drainage, dams were subordinate thereto, and must he disciplined into subjection as much as a recruit through the goose step. While the Supreme Court admits, as a matter of oourse, that "the drainage of a State ie a public purpose in which the pnhlic may he interested," yet they remark that "the storage of debris is in its nature a private matter in which ths few are only interested." Evidently they had no concsption of what State drainage may involve, or they could not havs drawn such a distinction. Thsn, regarding the dams as a nrivate enterpriss, they deny the power of the Lsgislaturs to imposs taxes to further it. But the gravensss of ths charge hreaks down entirely if the dams wers for a puhlic purposs, and the private bsnefit is only incidental, whils the public bsnefit was as hroad as the district, or the ssveral districts designed for the Stats. But ths piunacle of absurdity is reached when they quote a fundamental law of the Constitution which has no sort of application in ths prsmises. "Taxation is a mode of raising revenue for public purposes. Whsn it is prostituted to objects in no way connected with the public intersst or wslfare, it ceases to he taxation and hecomes plunder." Of courss the inference they intended to draw by that is as clesr as it is nnwarrantahle. That the dams designsd by the State Engineer for ths public henefit, is in fact a private enterpriss for ths benefit of certsin parties, and therefors a tax for such purposs becomes plunder. The implied accusation is so outrageous and insulting, even to the Governor himself, who was made President of the Drainage Commissioners hy ths act, that it is astonishing that he has not rspudiated it in strong terms.

Further on, we ars told that "ths title does not express the objects or legislation smbodied in the provisions of the act;" but if ths title in the full acceptation embraces them, then it cannot be in conflict; yet on this narrow visw they, forsooth, declare that "the title is narrower than the hody of the act," and that "to prohibit such legislation was the sole end and aim of ths constitutional requirements." That would be iudeed a perverted view of the Constitution which csnnot understand "what there is in a name." The name is particularly significant, comprehsnsivs and concise, and for that reason highly creditable to the author of ths bill.

Justice Sharpstein's dissent and accordance with the court bslow in favor of letting contracts under the hill, will psrhaps yet prevail, for the Supreme Court laid down a rule which they acknowledged should guide thsm, but will admit of a very diffsrent construction than they adopted. They remark that "in considering such a question as overruling the Legislature, it is a csrdinal rule that nothing hut a clear violation of the Constitution will justify a court. Every statuts is presumed to hs constitutional, and every intendment is in favor of its validity. When a statnte is challenged, as in conflict with the fnndamental law, a clear and substantial conflict must hs found to exist to justify its condemnation." If none of ths objections of the Snprems Court are entitled to hold, and especially not in regard to conflict with title, thers is thsn neither a clear violation nor substantial conflict with the Constitution in the case, and the ruling ought to he reversed by soms still highsr tribunal, for, again, we may remark that the Suprsme Court failed to consider ths msrits of the cass, or ths complaint that was raised in ths Sacramento Court, April 29, 1881, which that court ovsrruled in favor of defendants. The plaintiff's complaint is that "the letting of contracts and expenditure of money will cause irreparable injury to the residents and taxpayers within the proposed drainage district," the tax being only 1-20 of 1% or 50 cents on each $1,000 property! No attempt was made to prove the irreparable damage that would accrus to plaintiff hy contrihuting 50 cents for their own protection, and in fact, it was too egregiously absurd for the Sacramento Court to entertsin, and moreover the people (the plaintiffs) had asked for that protection and that tax through the Legislaturs that gave them the hill. What presumption then for a few persons calling themselves *the people* to have gone into court and ask it to upsst the will of the Lsgislaturs and Executive!

Justice Sharpstein had no douht of the validity of contracts under the law, although he was not so snre of the legality of the mode of levying the tax, hut if there was a technical difficulty of that kind, it could have been amended in a subsequent Legislatnre; and still, if the people who had got the hill passed, kept faith with themselves, they would have paid the tax cheerfully and enjoyed the ehare of protection it afforded. However desirable it may he now, perhaps, that Congress will take the whole matter in hand, it might have been still bstter if the Governor had proceeded to let contracts according to Judge Sharpstein'e ruling, and the real gravity of the situation, which requires energetic measurss to prosecute the works shown to be necessary by the State Engineer to improve the rivers and afford protection for the Sacramento valley lands. The old adage, "delays are dangerous," was never more pointed thau at present. A SACRAMENTAN.

J. MCNALLY, the new Superintsndent of the Day Co., informed the Pioche *Record* that the company's furnace wonld not resume operations again this winter. This is positive. The work at the mines will be pushed vigoronsly and they will he placed in a condition so ore can he extracted and hoisted at less expense than at present. The mines will be thoroughly prospected, and if the ore body warrants it then new furnaces will he erectsd.

TOMBSTONE *Epitaph:* The Banner mine, the shaft of which is on Allen street, adjoining the county hospital, has been bonded for $100,000 for 30 days. The bond was taken, it was said, for prominent San Francisco mining men.

Building Dams.

The hydraulic miners of the northern portion of Sierra county, havs purchased sevsral miles of the bsd of Slats creek, at great expense, and have huilt dams thersin to restrain the flow of debris toward ths valley, for which thsy dssrve great credit. Among those connected with this project ars Morgan & Donahoe, of St. Lonis, Kingdom Bros., of Poverty Hill, Gso. Cox, of Pins Grove, and prohahly the owners of hydraulic mines at Gibsonville. The initial dam is located abont three miles above a point where the road from Scalss diggings to Strawbsrry valley cross Slats creek. A snbstantial dam hetween 20 and 30 ft high, has been srected at a very favorable point for the purpose intendsd, and it is estimated by those who have ssen the work, that it will hs years bsfore any of the heavier detritus will get over it. When the large hasins ahove the structurs become filled, the work will be added and a still lsrger arsa of depositing ground will be affordad. As a matter of fact, very little, if any, of ths sand put into the trihutsries of Slate cresk, has yet reached the Yuba. From the point where ths hsaviest work has besn dons, to the north Yuba river, the distance is ahout 30 miles, and the grade of the creek is so light that all the coarser tailings have bsnked up along its hsd, heing in placss 50 ft deep. Without the dams years would elapss bsfors anything but the very lightsst of the dsbris would reach the valley from this source. The miners in the Slats cresk basin, realize, however, that the time may come whsn thsrs will bs danger of their debris getting into the rivsr, and havs taken this action to prevent, as far as they can, any damags from the working of thsir minss. The particles of soil hsld in suspension by the water as a matter of course go down with the flood. But this lighter or alluvial soil is one of the best fertilizsrs known, and doss no damage other than to fill up the river bed and muddy the water. In this whole hasin thsre is very littls pipe clay, which is the particular slicken that cracks open upon drying and damagss agricultnral land when deposited upon it.

The miners at Scales, Boycs Bros. and others, have also huilt dams in Rock cresk, a tributary of Slate creek, and are preparsd to taks cars of their tailings. They havs also first-class facilities for doing this, aud nnless the conrts dscide that the miner cannot muddy the water, which is not probahle, all the minsrs on the north sids ars prepared to continue work indefinitely, without damage to any one.—*Mountain Messenger.*

Dosoris.

Ths Dosoris camp, about 14 miles south of Prescott, is one of the most promising camps in northsrn Arizona, and one which will, ers long, he turning out considerahls bullion. The hirst claim was found in this camp about six months ago, and since thsn many other flattering prospects have heen discovsrsd. Since the location of the Dosoris, the first in the camp, a forcs of men havs been steadily smployed developing the mine and takiog out ors. Thsy have a tunnsl in on ths ledge about 40 ft. and ars at present sinking a shaft, which is down 60 ft. It is their intention to start a tunnsl soon at the hase of the hill which will tap the ledgs at a considerahls depth. Ths lsdge is 5 ft. in thicknsss, with good, solid walls on both sides, and in soms places the ore body is the full width of the ledge. The ore is very high grads and shows metallic silver in considsrahls quantities.

The Buzzard and Rsven, two othsr claims, are showing fine ore. Anothsr claim in this district well worthy of mention is the Blue Dick. A quarter interest in this claim was sold thres wesks ago for $1,000. They are at present running a crosscut tunnsl to tap the ledge. The ore is similar in charactsr to ths Dosoris. The Mark Twain and North Star, two north extensions on the Blue Dick, show similar cropping to that found on the original claim. No work as yst has hsen done on sither of thsm. The camp can boast of a saloon, a good boarding-honse, plsasant quarters for the superintendent and almost a dozen tents. Taking into consideration the high grade quality of the ore, and the ahundance of material to work smelting ores, the camp certainly has a hrilliant future in etore for it.—*Arizona Miner.*

A PECULIAR SENSATION.—James Rowe, the man who was blown up at the Forman ehaft and lost hoth of his arms and his eyesight, is still hlown np nightly in imagination. He yeeterday told Dr. Webber that he felt that he was getting a good deal bettsr. Said he: "Now I am only obliged to die once per night, whereas a few daye ago I had to he killed twice or three times nightly." What he meant was that nightly it appeared to him that the explosion again occurred, and that he was knocked senseless by the flying fragments of rock. The Doctor says this is a thing that givee a great deal of trouble to all patiente who have heen hurt hy caves or explosions. It often prevents them from eleepiag. No sooner do they hegin to doze than the cave comes or the explosion occurs, aud they awake with a start and cry out.—*Virginia Enterprise.*

A LARGE number of the idle men out in Brietol district are now devoting their attention to prospecting. This is a hig improvement in the way of "killing" time than to he loafing around ealoons drinking, and ewindling the saloonkeepers out of their poor liquor.

The Debris Dam Below La Porte.

The dam recently built in Slate cresk, below La Porte, has been completed, and is a vsry substantial structurs. Soms ons in that sscton, evidently well posted, gives the Marysvills *Express* ths following dsscription of it: "The works are built to corral the debris from the mines of La Porte, Port Wine, Gibsonville, Poverty Hill, Howland Flat, St. Louis and Gardner's Point. These companies havs purchased sevsral milss of the Slats cresk bedrock, running up strsam from the dam. The grade of this stretch of bed-rock is vsry light, and the capacity for the storage of debris is unlimited. The construction of ths dam was under ths supervision of U. S. Deisem, forsman of ths Sears Union Watsr Co., and was completed lsst week. It is located ahout three miles below the Amsrican houss, and is built in ths main of timher and rock. Its dimsnsions ars 80 ft. long and 17½ ft. high. Ths foundation is upon solid bed-rock, and the wings are secured firmly in the rocky sidss of the canyon. A crib of heavy timher filled with large boulders forms ths center, and from this bulwark to either side of ths canyon and into the rock extends ths horizontal timhers. These are stayed by tiss 40 ft. in length sxtending up stream. The sizs of the upright timbers is from 15 to 20 inches, dove-tailed and pinned from top to hottom. The cross timhers are from 30 to 36 inches in diamster. The work hss heen complstsd at considerahls outlay of cspital and nndsr very trying circumstances, owing to the late storms and freshets. But the builders had ths advantags of an unlimited quantity of timhsr from which to draw, on ths canyon sides above ths works, and an abundanco of rock on the site of the dam. Ths late freshet, although quite extensive, had no effsct whatsvsr on the yst unfinished condition of ths dam. This work will hs raissd from time to time as ths filling of the ressrvoir above goes on, although ths present cspacity is thought sufficient for two or three years. The capacity of the canyon for the storage of dsbris is from 1,000 to 1,500 ft. wide, by 500 ft. in depth."

The Men in the Mines.

Ths Chicago *Mining Review* has ths following to say of the msn in ths mountains and the mines versus the men iu the stock hoards:

"There appears to bs a fesling on the part of a certain class of journals which livo in the atmosphers of ths stock hoards, that when a break comes and the stock exchangss are dull and dessrted, that the foundations of mining are thrsatened, and that the strong hands in mountain fastness and dssert plain wisiding pick and drill ars paralyzed by the wild speculations of ons party or the other in financial csnters where the exchanges exist.

"Mining for prscious and useful metals throughout the length aud hresdth of the land is nnconscious of ths mimic pandemonium which is daily witnessed, whsre it would seem that the mines were heing tossed to and fro like fallen leaves in thsantumn wind. Ths thundsring crash of ths stamp mill in the land, liks the ponderous footstsps of a giant crushing mountains heneath his mighty feet, and the stsady stream of hullion, like a molten river of treasure, flowing from ths smelter, and the flumes from Mains to California, drowns the tiny conflicts of the exchanges, as the rolling thnnder and the hurricane of the tsmpest hush the twittsr of a sparrow. Thsy have hut a faint conception of the grandeur aud magnitude even of ths mining industry of ths present, which is only the seed time and the harvest, compars with what it will bs in the futurs, who fear that a few broksrs, in any or every city, by shouting the price of stock, with the names of mines attached, can wake, ths eternal slumber of the monntains rsaching to hesvsn, and change one particle of the treasnre they hold in rocky vaults in their hosoms, waiting to he unlocked and given up to the dsmand of a world's industries."

IRON SHIPBUILDING.—Iron shipbuilding will hs further extended in the north of England in the beginning of next year. Two new firme will commence huilding on the Wear; one is a company—the North of England Shipbuilding Co.—and the other ie a private partnerehip. Two large huilding yarde have been opsned ou the Tyne this year, one hy the removal of an existing firm to largely extended premises, and the other hy a Glasgow firm. Extensive new marine engine worke have also been opened, and other works are in course of construction at Wallsend-on-the-Tyne. The manufacture of steel boilere for steamere is a growing branch of industry. Workmen are very fully employed in all branches of trade connected with iron shiphuilding. Several marine engine factoriee have heen working night and day ehifte over the past two months, and new firms are using the electric light shifts with great enccess in working out the night shifts.—*Iron.*

THE hydraulic mining companies of La Porte, Port Wine Gibeonville, Poverty Hill, Howland Flat, St. Louis and Gardiner's Point, Sierra county, having purchased several miles of the hed of State creek for a dump, have constructed a strong dam across tbe creek in which to impound the debris from all the minee in these localities. The dam will be raised from time to time ae required, and the canyon in which it is sitnated has a storage capacity of from 1,000 ft. to 1,500 ft. in width and 500 ft. in depth.

Mechanical Progress.

How to Melt Babbit Metal.

I wish to say a few words in reference to the treatment of Babbit and other similar anti-friction metals. Workmen who are unaccustomed to mixing or treating metals while in liquid state, will generally melt such metal upon a blacksmith's forge, by applying heat so rapidly that the ladle will become red hot before the metal within it begins to melt. When it has melted a dross rises to the surface and is skimmed off by the workmen and thrown away. This skimming process is kept up as long as the ladle is kept on the fire. Now such a course is all wrong, because, by applying heat too suddenly, the metals which fuse at lower degrees of heat sweat out, and are burned before those which melt at higher temperatures become fluid.

The dross, as it is commonly called, which rises to the surface, is in many cases the antimony or hardening property of the alloy, and should not be thrown away. The surface of the melted metal should be kept covered with fine charcoal, which will prevent oxidation. A small lump of sal-ammoniac should also be kept upon the surface of the metal. The metal should always be stirred before pouring, otherwise the heaviest metals will separate and sink to the bottom of the ladle, and a constantly varying quality of metal will be the result.

By melting the metal slowly and keeping it properly fluxed as described, it will run sharp, each casting will be found uniform throughout, and the metal be of equal hardness. In observing these simple precautions, much of the dissatisfaction now experienced in using Babbit and other anti-friction metals will disappear, and the metal not be condemned because it simply obeys the laws of nature and separates when improperly treated.—*L. F. Lyne, in American Machinist.*

The Motor of the Future.—In the opinion of most of the scientists of Great Britain, electricity is to take the place of steam in driving machinery and moving cars, and is to be generated by the action of tides, winds and falling water. They predict that wind power will be utilized to a greater extent than any persons in a previous age ever believed it would. Wind will generate electricity for moving machinery, for lighting streets, and warming dwellings in Ireland, Belgium, Denmark and other countries where there are few streams that afford water power. The movement of tides will produce the same effects in most countries that have an extensive sea coast, while the fall of water in rivers and streams will generate electricity in all mountain regions. The great electrical exhibition at Paris did much to draw attention to what is called the motor power of the future. A picture called "The Queen of the Nineteenth Century" hangs in many of the shop windows. It is a female figure surrounded with a halo, and emitting rays of light from the hands, which are raised as if to enable the being to fly. The light gives the arms the appearance of wings. The artist is an enthusiast, and is regarded by many as a prophet. We all hope that his fair predictions will be realized. The steam engine is a good thing, but we are ready for something better. It has done so well that till recently scientific men and inventors have not troubled themselves to make something better.

Malleable Iron.—M. Forquignon has published an extensive series of researches upon malleable iron and the re-heating of steel, and among other conclusions he attaches special importance to the following: 1. Malleable iron always contains amorphous graphite. 2. A casting may lose carbon and yet remain brittle if the original quantity of graphite is not increased. 3. A casting may become malleable without losing any sensible portion of its carbon. 4. If silicium is added to manganesian castings they are improved by reheating. 5. Hydrogen and nitrogen may unite with the carbon of a casting so as to make it malleable without the production of graphite. 6. The breaking load is always more than doubled, sometimes more than quadrupled, by annealing. It increases with the duration of the heating, very rapidly at first and then very slowly. 7. Ductility generally increases with the resistance to breaking, but after a certain limit it has a slight tendency to diminish.

The Tensile Strength of Glass.—Traulionie gives the tensile strength of glass at from 2,500 to 9,000 lbs. per square inch, according to kind; crushing strength 6,000 to 10,000 lbs. per square inch; transversely, by his own trials, Millville (N. J.) flooring glass, one inch square, and one ft. between the end supports, breaks under a certain load of about 170 lbs., consequently it is considerably stronger than granite, except as regards crushing, in which the two are about equal. It is suggested that glass will shortly be used for many purposes where other and much inferior materials are exclusively employed. Glass may be used as water conduits to better advantage than cast iron or terra cotta, as it is impervious to moisture and proof against corrosion or chemical action. It is already considerably in use for flooring, and it has lately been successfully experimented with for railway sleepers under exceptionally severe conditions.

Cost of the Storage of Power.

In regard to the comparative cost of the storage of power by electricity and compressed air, Col. Beaumont writes thus to the London *Times:* "Attention having lately been directed through your columns to the storage of power by means of air and electricity, and it appearing from the speeches of the chairmen of certain railway and tramway companies that misapprehension exists with regard to the cost of air, I beg leave to state that air is now being compressed to 1,000 lbs. on the square inch with far less cost and difficulty than has hitherto been accomplished with steam at high pressures. Independent proof of this will shortly be forthcoming from a body of well-known scientific gentlemen who have investigated and tested the matter for themselves.

"For locomotive purposes, the results obtained from the storing of electricity do not approach those obtained from the storage of air in the amount of force actually available for traction or propulsion. For tramways there is no doubt of the cost of air being considerably below steam, and air engines could be used on the Underground railway at a cost in capital expenditure somewhat in excess of that for steam engines, but in daily working the expenses would be very trifling, if any, beyond the present cost of steam, while it is obvious that the difficulties of ventilation and deterioration of girders would vanish."

New Material for Metallic Ships.—A London company has recently built, by way of experiment, a small steam yacht of phosphor-bronze. The vessel is built entirely of that material. Her length is only 35 ft., her beam about 6 ft., and she attained a speed of 12½ miles per hour, which, considering her size, is a creditable performance. The chief object of the company in having so small a craft built was to test the rigidity of the phosphor-bronze sheet and angle pieces used in her construction, prior to having boats built on a large scale. The results of the trial trip have been beyond the company's expectation as regards rigidity and absence of vibration. As the cost of phosphor-bronze boats will not much exceed that of steel boats, and as the metal is not subject to corrosion like iron or steel, and also retains its value, the use of the material in the construction of steam launches, torpedo boats, etc., is probable.

A Filler for Porous Hard Wood.—Among the many fillers in use for porous hard wood, this is recommended as one of the best: Stir boiled oil and corn starch into a very thick paste, add a little japan and reduce with turpentine, but add no color for light ash. For dark ash and chestnut use a little raw sienna; for walnut, burnt umber and a slight amount of Venetian red; for bay wood, burnt sienna. In no case use more color than is required to overcome the white appearance of the starch, unless it is wished to stain the wood. The filler is worked with brush and rags, in the usual manner. Let it dry 48 hours, or until it is in condition to rub down with No. 0 sand paper, without much gumming up, and if an extra fine finish is desired, fill again with the same materials, using less oil, but more of japan and turpentine.

To Prevent Wood from Shrinking.—Carefully conducted experiments have shown that wood, well saturated with oil, when put together, will not shrink in the driest weather. Wheels have been known to run for many years, even to wearing out the tires. Very many dollars might be saved annually if this practice was adopted. Boiled linseed oil is the best for general use, although it is now known that crude petroleum, on even old wheels, is of great benefit.

Life of Steel Rails.—An engineer of the Rhenish railway, which has had the longest experience in steel rails, has made a calculation according to which the average duration of steel rails, when 24 trains pass over them every day, is 30 years, while that of iron rails, with a traffic of 17 trains, is 11 years. Steel rails, according to this calculation, last four times as long as iron rails, although they are but one-third more expensive.

The Economy of Steel Ships.—The English *Nautical Magazine* thinks that steel ships pay. A steel ship was built in 1877 for the Bilbao ore trade at a cost of $91,750, or $7,750 more than she might have been obtained for if built of iron. The earnings of this vessel, due to increased carrying capacity, have amounted to $2,800 per annum, a yearly gain, which is a very fair percentage upon $7,750.

Progress of Bessemer Steel Manufacture.—Four new Bessemer steel plants will be in operation during the year—one in Colorado, one at Scranton, Pa., one near Pittsburg, and the South Chicago works. Besides this the old plants are materially increasing their capacity by introducing larger converters, and several mills are putting in rail trains to roll foreign blooms.

Burning Over Soil.—M. Fleischer has made a comparison between the barks of young oaks grown respectively upon sandy loams, upon peaty soils that had been once burned, and upon a similar soil that had been thrice burned, and found the proportion of tannin highest in the product of peaty soils,

Scientific Progress.

The Materials of Paleontology.

Although paleontology is a comparatively youthful scientific specialty, the mass of materials with which it has to deal is already prodigious. In the last 50 years the number of known fossil remains of invertebrated animals has been trebled or quadrupled. The work of interpretation of vertebrate fossils, the foundations of which were so solidly laid by Cuvier, was carried on with wonderful vigor and success by Agassiz in Switzerland, by Von Meyer in Germany, and last, but not least, by Owen in this country, while, in later years, a multitude of workers have labored in the same field. In many groups of the animal kingdom the number of fossil forms already known is as great as that of the existing species. In some cases it is much greater; and there are entire orders of animals of the existence of which we should know nothing except for the evidence afforded by fossil remains. With all this it may be safely assumed that, at the present moment, we are not acquainted with a tithe of the fossils which will sooner or later be discovered. If we may judge by the profusion yielded within the last few years by the Tertiary formations of North America, there seems to be no limit to the multitude of mammalian remains to be expected from that continent, and analogy leads us to expect similiar riches in Eastern Asia whenever the Tertiary formations of that region are as carefully explored. Again, we have as yet almost everything to learn respecting the terrestrial population of the Mesozoic epoch—and it seems as if the Western Territories of the United States were about to prove as instructive in regard to this point as they have in respect of Tertiary life. My friend Prof. Marsh informs me that, within two years, remains of more than 160 distinct individuals of mammals, belonging to 20 species and nine genera, have been found in a space not larger than the floor of a good-sized room; while beds of the same age have yielded 300 reptiles, varying in size from a length of 60 or 80 ft. to the dimensions of a rabbit.

The task which I have set myself to-night is to endeavor to lay before you, as briefly as possible, a sketch of the successive steps by which our present knowledge of the facts of paleontology and of those conclusions from them which are indisputable has been attained; and I beg leave to remind you at the outset that, in attempting to sketch the progress of a branch of knowledge to which innumerable labors have contributed, my business is rather with generalizations than with details. It is my object to mark the epochs of paleontology, not to recount all the events of its history.—*Prof. T. H. Huxley, in Popular Science Monthly.*

Decomposition of Steam.—At a recent meeting of the American Academy of Sciences, an apparatus illustrating the decomposition theory of steam boiler explosions was shown at work, proving, according to the inventor, that steam might be decomposed by simple heat into the constituent gases of water—oxygen and hydrogen. The experiments conducted were interesting, but perhaps not conclusive as showing a possible cause of boiler explosions. The apparatus was very simple—a flask in which water was heated, a tube conveying the steam into a closed platinum crucible, where it was again heated by a spirit lamp, and a tube thence carrying the superheated steam and the liberated gases to an ordinary pneumatic trough, where the mixed gases were collected in a test tube, while the steam was absorbed. At the conclusion of the experiment, the gases thus collected were exploded by a lighted match, showing that they were the components of water. The experiment indicates that this explosive mixture of gases may be formed in a steam boiler, but it is scarcely probable they ever would be. The boiler must, at least in part, be raised to a full red heat. Then cold water must be injected, for so long as steam and the gases are mixed, the latter cannot explode. The injection of water must condense the steam in the boiler before it cools the red-hot iron. All these very probable conditions being fulfilled, an explosion of the gases may take place.

Separation of Aluminum from Iron.—The neutral or slightly acid solution is treated with hyposulphite of sodium until all ferric compound have been reduced. A solution of cyanide of potassium having twice the volume of the iron-aluminum solution, and containing from 15 to 20 grams of cyanide of potassium, is heated to boiling, and the iron-aluminum solution slowly poured into it. The solution is then quickly cooled, acidified with acetic acid, and the aluminum precipitated with carbonate of ammonium. If the aluminum hydroxide has not a pure white color, it must be dissolved and reprecipitated. The separation is quantitative.

Liquid Carbonic Acid.—The chemical works of De Haen, in List, near Hanover, have for some time past been engaged in the manufacture and sale of liquid carbonic acid. The liquid is compressed in cylinders having a capacity of about 10 litres, which are tested to a pressure of 100 atmospheres. Should the railway companies decide to carry these cylinders, it is expected that the liquid acid will soon come into general use in the soda water trade.

Effects of Atmospheric Electricity on the Telephone.

Of late several European observers appear to have been studying the effects of certain meteorological phenomena on the telephone, the latter being connected with a wire stretched, for instance, between the roofs of two houses, and in connection with the water or gas pipes. On the occurrence of lightning, more especially, sounds are heard, and at the same instant (according to M. Rene Thury, of Geneva) as the flash is seen, whatever the distance of the latter. Even when no thunder was heard, and the discharge must have been at least 35 km. off, M. Thury observed those induction effects. He says the sound is like that of a Swedish match rubbed on the box. The telephone affords an easy method of studying the velocity of transmission and other features of this electrical influence. M. Lalagade, who has experimented similarly for some time past, thought to amplify the sounds, and did so by placing two microphones on the plate of the receiving telephone. The arrangement is set up in a quiet room, where all foreign vibrations are guarded against, and the author is able to hear the least sound at a distance of one meter or more from the second telephone.

Again, M. Landerer, at Tortosa, finds currents produced in his telephone-circuit by atmospheric electricity in three different ways. First, the condensation of aqueous vapor results in a sound recalling the cry of tin. A sensitive galvanometer in the circuit is not, or hardly, affected. These sounds are strongest at night. Next, there are the sounds which occur during lightning (and the currents producing which affect a galvanometer considerably). Thirdly, the wind generates currents which do not act on the telephone, but act on the galvanometer strongly. At Tortosa, the very dry west winds produce the greatest oscillations. Telluric or earth currents act both on the galvanometer and on the telephone; they are distinguished from atmospheric currents by the regularity and continuity of their action during pretty long intervals.

Engraving by Electricity.—M. Plante has succeeded in engraving on glass by means of electricity. The process is as follows: The glass is laid in a horizontal position, and covered with a concentrated solution of nitrate of potash, the liquid being retained by a shallow vessel in which the glass is placed. A platinum wire is dipped in a horizontal position in the solution along the edges of the glass. The wire is attached to one of the poles of a secondary battery of 50 or 60 elements. The lines are traced by hand with the point of an insulated platinum wire connected with the other pole of the battery. The parts of the glass covered with the alkaline solution become engraved when touched with the end of the platinum wire, however rapidly this is moved, the thickness of the lines varying with the thickness of the wire. The current from either pole may be used in the writing wire.

Solid Petroleum.—According to a St. Petersburg paper, a German, Herr P. N. Wetmer, has practically solved the problem of rendering petroleum solid—a problem considerably studied by chemists of late, in view of the large question of transport. A company has been formed in Russia to work the patent when completed. The mode of treatment is not yet disclosed, and chemists to whom small samples of the solid petroleum have been sent have not been able to make out the nature of the foreign substances that are added in a proportion of 2, or at most 3%., to solidify the petroleum.

Influence of Light on Germination.—Herr Stehler's researches do not confirm the theory that light hinders germination of seeds generally. He admits the probability, however, that light may not be advantageous in the case of seeds that germinate quickly and easily, such as clover, beans or peas. He says that the germination of certain seeds, especially those of the grasses, will not take place at all, or with great difficulty, in darkness.

Cloud Indications.—When the whole sky is covered with clouds, their further formation and increase in bulk and density is indicated by their descent to a lower level, and their decrease by their ascent. Accordingly, when clouds begin to sit down upon the tops of the hills, it prognosticates rain, and when they begin to rise above the hills, it prognosticates dry weather.

Plant Growth.—When the earth in which a plant grows is much warmer than the air, the plant grows very thick, ceases almost altogether to increase in hight, and finally shows deep, transverse rifts which make farther growth an impossibility. These effects were produced by M. Prillieux who used a large dish of earth, in which he planted the seeds, and kept the earth 10° warmer than the moist air of the room.

Progress of the Telegraph in China.—The Chinese seem to have given up their stupid opposition to the telegraph, and this important factor in modern progress is now making fair advance in that country. In 1871 the length of wires in use amounted to 3,929 miles, while in 1880, 9,345 miles were in operation.

It is estimated that the bullion output of Arizona for 1881 will reach $18,000,000.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Dec. 15.		Week Ending Dec. 22.		Week Ending Dec. 29.		Week Ending Jan. 5.	
Alpha	3	2½	2.95	2.80	2.60	2	2	....
Alta	4	3.90	4¼	3.85	4.05	3.90	4.35	4.15
Andes	1.10	1	1.90	85c	85c	80c	80c	70c
Alhion	1.90	1½	1.95	1 60	1.60	1½	1.90	1½
Argenta	....	....	....	....	....	....	....	....
Addenda	15c	5c	10c	....	....	....	....	....
Belcher	1.90	1.65	1.90	1½	1.85	1.60	1.85	1.60
Belmont	35c	....	60c	....	75c	70c	....	....
Best & Belcher	8½	8¼	8¾	7¾	7¾	7½	7¾	7¾
Bullion	1.20	1.15	1.65	1½	1.40	1.35	1.30	1½
Bechtel	20c	....	20c	15c	10c	....	....	....
Belle Isle	....	....	....	....	....	....	....	....
Bodie	3.10	2.60	3¼	3	2.90	2.60	2¾	2.45
Benton	70c	65c	80c	70c	70c	65c	75c	....
Bulwer	2.85	2½	2¾	....	2.70	2.65	2.90	2¾
Boston	40c	....	50c	....	....	....	60c	50c
Black Hawk	....	....	....	....	....	....	....	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	5c	....	5c	....
Caledonia	10c	....	10c	....	5c	....	5c	....
California	50c	....	50c	40c	35c	25c	35c	30c
Challenge	70c	60c	60c	5 c	55c	....	60c	....
Chollar	1½	1.30	1.45	1.30	1.15	1	1.20	1.05
Confidence	2½	2.30	2¾	2½	2.40	2½	2¾	2.05
Con Imperial	5c	....	10c	....	5c	....	5c	....
Con Virginia	1.60	1½	1.60	1.30	1.35	1	1.10	75c
Crown Point	1.20	1.05	1½	1.05	1.10	90c	1.15	1
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1.80	1½	1¾	1½	1¾	1.40	1½	1.40
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	2.40	2.35	2¼	2.45	2¼	2.15	1.80	....
E. Mt. Diablo	50c	30c	40c	35c	....	....	40c	35c
Eureka Con	13½	11	14	13	13	11¼	13	12½
Exchequer	1.05	95c	1.10	1	1	85c	1	90c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	15c	....	5c	....	....	....	....	....
Golden Gate	2¾	2¼	2¾	2.05	2.15	2	2.30	1.95
Goodshaw	25c	....	25c	....	20c	10c	25c	....
Gould & Curry	5¾	5¼	6¼	....	4.40	3.60	4.05	3¾
Hale & Norcross	2.45	2.30	2¼	1¾	1.80	1.60	1.70	1.40
Head Center	55c	....	50c	....	40c	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	25c	15c	....	....	10c	5c	10c	....
Justice	70c	60c	75c	65c	75c	60c	70c	60c
Jackson	....	....	....	....	....	....	....	....
Juniter	....	....	....	....	....	....	....	....
Kentuck	1	90c	1	45c	1¼	60c	....	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	2	....	1¼	1.40
Martin White	3	2¾	3.05	2¾	2¾	....	....	....
McClinton	....	....	....	....	....	....	....	....
Meno	80c	70c	80c	60c	60c	....	70c	40c
Mexican	11¼	10½	10¾	9¾	9¾	8½	10	9¼
Mt. Diablo	6¾	6	7	6¾	7	6¾	7	6¾
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	35c	30c	35c	25c	25c	....	30c	15c
New York	5c	....	....	....	....	....	....	....
Northern Belle	10¾	9¾	9¾	9	8¾	....	8¾	8¼
North Noonday	....	....	35c	30c	....	....	25c	5c
Navajo	15c	....	20c	15c	25c	20c	25c	....
Occidental	1	....	....	....	....	....	1	95c
Ophir	7¾	6¾	6¾	6¾	6¾	5¾	6	5¾
Original Keystone	....	....	....	....	....	....	....	....
Overman	1¾	1.70	1¾	1.30	1.45	1¼	1¼	1.30
Oro	20c	15c	25c	15c	20c	15c	20c	15c
Paris	....	....	....	....	....	....	....	....
Potosi	1.80	1.10	1¾	1.40	1.40	1.35	1½	1.40
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	3	2¾	2.90	2	2.05	1¾	2	1.45
Seg Belcher	5	....	5	....	....	....	3¾	....
Sierra Nevada	11¾	10¾	10¾	9	9¾	8¾	9¾	8¾
Silver Hill	35c	30c	30c	25c	20c	10c	20c	15c
Silver King	20	19½	19½	18½	19¾	19	19¾	19½
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	1.35	1.10	1.35	1.10	1.20	1.05	1.15	1.05
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	5c	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	20c	....	20	....	20c	....	20c	....
Tioga Con	10c	....	....	....	....	....	10c	....
Tiptop	5	....	....	....	3¾	2¾	4	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	18	14¾	16¼	14¾	15	13¾	15	13¾
Utah	7¾	7¾	7¾	6¾	....	....	6¾	6
Ward	3.70	3.60	3.60	....	3¾	....	3¾	....
Wales	....	....	55c	....	75c	....	55c	50c
Yellow Jacket	4.15	3¾	4.40	3.60	3¾	3.10	3.40	3.05

Sales at S. F. Stock Exchange.

Thursday A. M., Jan. 5.

125	Alpha	750	Regeut 10c
70	Alta 4¼	200	Savage 1.45@1½
150	Andes 70c@75c	200	Sierra Nevada 8¾
320	Belcher 1.60@1.65	200	Silver Hill 20c
60	B & Belcher 7¾	250	Scorpion 1.05
725	Bullion 1.30	330	Union 13¾
50	Benton 75c	20	Ward 3¾
140	California 30c	330	Yellow Jacket 3.10@3.05
1325	Con Virginia 85@75c		AFTERNOON SESSION.
110	Chollar 1.05	440	Alhion 1.70
100	Crown Point 1	170	Bodie 2.40@2.45
5200	Con Imperial 5c	100	Day 1¾
350	Exchequer 80c	50	E Mt Diablo 30c
300	Gould & Curry 3.65@3.60	50	Eureka Tunnel 1¼
200	Golden Gate 1.95	150	Holmes 25c
570	Hale & Nor 1¾	200	Mono 90c
25	Justice 60c	10	Northern Belle 8¾
350	Mexican 9¾@9¼	550	Navajo 25c
195	Ophir 6¾	10	Noonday 25c
600	Overman 1.30	50	N Noonday 5c
125	Occidental 1@25c	200	Oro 15c
185	Potosi 1.40@1.45	25	Silver King 19½
		100	Tiptop 4¼

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Ophir, Dec. 31st, $18,541; Hananer, 30th, $2,150; Horn Silver, 30th, $30,000; Hananer, 28th, $4,250; Horn Silver, 28th, $27,500; Bullionville, 28th, $2,042; Barbee & Walker, 28th, $31,576; Barbee & Walker, Jan., $2,012; Hanauer, 1st, $2,150; Germania, 1st, $2,400; Leonore, 1st, $500; Ontario, 1st, $8,900; Horn Silver, Dec. 31st, $55,000; Stormont, 30th, $7,460; Hanauer, 30th, $2,090; Horn Silver, 29th, $17,500; Barbee & Walker, 30th, $91,970; Steward, 30th, $7,500; Northern Belle, 28th, $15,500; Winnemucca, 30th, $1,200; Star, 23d, $4,505; Standard, 26th, $43,776; Northern Belle, 26th, $4,208; Contention Con., 30th, $14,875; Northern Belle, 28th, $4,418; Star, 26th, $2,664; Northern Belle, 31st, $8,141; Contention, 30th, $15,734; Bodie, Jan. 3d, $6,695; Silver King, Dec. 28th, $20,315; Christy, 30th, $4,371; Manhattan, 30th, $11,028.13; Leeds, Jan. 3d, $1,795; Head Center, 30th, $4,080.28; Silver King, Dec. 31st, $28,400; Star, 30th, $3,301.54; Day, 30th, $5,500.

THE year 1882 began on Sunday and will end on Sunday.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alhion Con M Co	Nevada	9	30	Nov 25	Dec 29	Jan 19	D B Chisholm 327 Pine st
Alta S M Co	Nevada	22	50	Dec 16	Jan 20	Feb 9	W H Watson 302 Montgomery st
Betty O'Neal M Co	Nevada	2	25	Nov 14	Dec 19	Jan 5	R W Heath 318 Pine st
Belmont M Co	Nevada	30	15	Nov 11	Dec 19	Jan 16	J W Pew 310 Pine st
Best & Belcher M Co	Nevada	22	50	Jan 4	Feb 7	Feb 23	Wm Willis 309 Montgomery st
Bodie Con M Co	California	1	50	Dec 6	Jan 14	Feb 13	W H Lent 309 Montgomery st
Bechtel Con M Co	California	2	25	Dec 3	Jan 9	Jan 30	W H Lent 309 Montgomery st
Black Hawk G M Co	California	13	10	Nov 9	Dec 17	Jan 4	H A Charlea 419 California st
Caledonia S M Co	Nevada	38	25	Dec 6	Jan 7	Jan 26	R Wegener 414 California st
Con Imperial M Co	Nevada	17	10	Jan 4	Feb 8	Mar 1	W E Dean 309 Montgomery st
Hale & Norcross M Co	Nevada	72	75	Dec 21	Jan 25	Feb 16	J F Lightner 309 Montgomery st
Kentuck M Co	Nevada	17	30	Nov 23	Jan 3	Jan 23	J W Pew 310 Pine st
Lady Bryan S M Co	Nevada	6	25	Dec 5	Jan 10	Jan 29	C V D Huhhard 310 Pine st
Mono G M Co	California	15	50	Dec 5	Jan 10	Jan 31	W H Lent 309 Montgomery st
Navajo M Co	Nevada	15	15	Dec 3	Jan 17	Feb 8	J W Pew 310 Pine st
Nconday M Co	California	5	25	Dec 30	Feb 8	Mar 2	W J Taylor 310 Pine st
North Noonday M Co	California	5	25	Dec 30	Feb 10	Mar 6	W J Taylor 310 Pine st
North Standard G & S M Co	Cal	2	10	Nov 30	Feb 1	Feb 20	C V D Huhhard 310 Pine st
Original Keystone S M Co	Nevada	6	50	Dec 8	Jan 12	Feb 4	F E Luty 330 Pine st
Oro M Co	California	10	10	Nov 16	Dec 17	Jan 4	W Stuart 320 Sansome st
Pinal Con M Co	Arizona	1	25	Nov 19	Dec 27	Jan 16	W W Traylor 309 Montgomery st
Potosi M Co	Nevada	7	50	Nov 11	Dec 14	Jan 4	W E Dean 309 Montgomery st
Seg Belcher M Co	Nevada	20	1 00	Dec 5	Jan 6	Jan 26	C D Edwards 414 California st
Sierra Nevada S M Co	Nevada	71	1 00	Dec 29	Feb 1	Feb 20	E L Parker 309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	4	03	Dec 27	Jan 30	Feh 17	J M Buffington 309 California
Pay State S M Co	Nevada	1	02	Dec 29	Feb 6	Mar 6	J W Pew 310 Pine st
Buckeye M Co	California	4	50	Nov 10	Dec 19	Jan 19	W H Lowden 213 Sansome st
Butte Creek Hydraulic M Co	California	8	10	Dec 29	Feb 15	Mar 6	A L Taylor 230 Montgomery st
El Dorado W & M Co	California	19	75	Nov 12	Dec 22	Jan 16	R M Welch 524 Sacramento st
Horseshoe M Co	Arizona	1	02	Nov 30	Jan 4	Jan 23	J H Sayre 330 Pine st
Iowa M Co	Nevada	15	05	Nov 9	Dec 17	Jan 6	C C Leavitt 411½ California st
Maybelle Con M Co	California	10	20	Dec 31	Feh 7	Mar 1	W J Taylor 310 Pine st
Mayflower Grav M Co	California	14	10	Dec 30	Feh 3	Feh 28	J Morizio 323 Montgomery st
McElroy Grav M Co	California	6	10	Dec 20	Jan 24	Feh 11	L Lillie 607 Washington st
Santa Anita M & M Co	California	2	02	Dec 14	Jan 16	Feh 2	J B Titus 34 Kearny st
University G M Co	California	10	10	Dec 13	Jan 19	Feh 9	W L Oliver 328 Montgomery st
Wide Awake Prospecting & M Co	Arizona	15	10	Dec 6	Jan 12	Jan 30	O Hildebrandt Chronicle building

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alexander M Co	——	A B Cooper	328 Montgomery st	Annual	Jan 27
Alhion M Co	Nevada	E M Hall	327 Pine st	Annual	Jan 9
Bullion M Co	Nevada	J M Brazell	328 Montgomery st	Annual	Jan 12
California M Co	Nevada	C P Gordon	309 Montgomery st	Annual	Jan 18
Con Virginia M Co	Nevada	A W Havens	309 Montgomery st	Annual	Jan 12
Hillside M & M Co	Nevada	F Frankenthal	330 Pine st	Annual	Jan 13
Iowa M Co	California	C C Leavitt	411½ California st	Annual	Jan 20
Independence M Co	California	E M Hall	327 Pine st	Special	Jan 7
Kossuth M Co	——	E F Stone	306 Pine st	Stockholders	Jan 16
Maryland Con M Co	California	E P Farnsworth	219 Sansome st	Annual	Jan 6
Rainbow G M Co	——	J C Chalmers	435 California st	Annual	Jan 16
Sierra Nevada S M Co	Nevada	E L Parker	309 Montgomery st	Annual	Jan 13
South Hite G M Co	——	F A Berlin	420 Montgomery st	Annual	Jan 9
South Spring Hill M Co	——	W H Reynolds	320 Sansome st	Special	Jan 16

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Alexander M Co	——	A B Cooper	328 Montgomery st	2 00	Jan 28
Black Bear Quartz M Co	California	W Letts Oliver	328 Montgomery st	20	Dec 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Jan 12
Father De Smet M Co	Dakota	H Dean	New York	50	Oct 17
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Dec 15
Northern Belle M & M Co	California	Wm Willis	309 Montgomery st	25	Nov 15
Silver King M Co	Arizona	J Nash	315 California st	25	Dec 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Jan 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	75 (extra)	Jan 12
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10	Jan 3
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10 (extra)	Jan 3
Western M Co	California	C S Curtiss	309 Montgomery st	75	Dec 22

Distributing Risks in Fire Insurance.

The great fires of Portland, Chicago, Boston and St. Johns have caused a revolution in the system of fire insnrance in more senses than one, not insignificant of which is distribution of risks and division of lines.

This theory had its incipiency with the large nnderwriting corporations of the time, and was by them taught their agents, and by their agents tanght the insuring public with ever varying success, nntil the oft occurring conflagrations and consequent crippling of companies, with its attendant confusion and loss to the insured burned into the reason of property owners the absolnte necessity of small lines and many companies to be reasonably protected against large fires.

In the scramble for business single companies under exclnsive management have gone down under the weight of heavy linee closely huddled together in burned districts, and the policy holders have been left with hnt their premium receipts to console them, where the facilities for distributing the risks among several companies and a disposition to make nse of these facilities would not only have saved the company's life, hnt wonld have protected the interests of the policy holder, and possibly saved him from financial ruin.

Now, companies and property owners have almost universally wheeled into line on tbis question, admitting its importance and practicing its lessons, until it is difficnlt for the former to put ont or the latter obtain a policy of insnrance covering more than $10,000; wbereas, two decades ago, it was not an unusual thing to find individnal companies carrying from $50,000 to to $150,000 on a single risk.

To accomodate this demand of the insuring pnblic, the well known firm of Messrs. Hntchinson & Mann, of onr city, have gathered aronnd them a large list of staunch Fire Insnrance companies, which, during the past ten years have promptly and satisfactorily met and paid their large losses (reaching more than $2,000,000), entitling them to their justly merited position of one of the *First* amonng the nnderwriting fraternity of onr coast—the heartfelt thanks of hosts of victims of fire, and the respect of all our business and commercial circles.

An individnal or a corporation's success in any field or enterprise is nsually the measnre of capacity and energy; and in the peculiar profession of fire nnderwriting, these two elements are especially reqnisite to snccess. That Messrs. Hntchinson & Mann have been snccessfnl in estahlishing and controlling in its minntest detail their enormons bnsiness of $600,000 annnally is an nnqnestioned fact, attained through eternal vigilance and personal solicitation and application. They bave not, like the hen in the fable, sat still after requesting others to scratch for them; but they also have scratched early and late, and we point to them with pride as probably the largest in point of premium receipts of any insurance agency in the United States.

The Mining Share Market.

Many of the operations at the leading Comstock mines are at points favorable to developments. Yet the market is very inactive. The main north drift on the 2500-level of the Sierra Nevada and the several crossents at that point are passing through vein material, which gives low assays wherever streaks of quartz make their appearauce. Ahout the same may be said of the east drift on the 2900 level of the Ophir and Mexican and, indeed, of the several drifts on the 2700. The grond is of a fertile character, and metal is fonnd wherever qnartz makes its appearance. At the bonanza mines the arrangements for ventilation ars not yet completed, yet the circnlation of air is very good, and work goes on at all points very comfortably. As yet most of this work is preparatory instead of exploratory.

At the Yellow Jacket they are now at work in some interesting ground, and are finding ore giving low assays in several directions. They have above their 3000-level a vast extent of nnexplored conntry.

The San Francisco Board has passed a resolution, to take effect Jan. 1, 1882, that the names of all future candidates for membership shall be referred to a committee. If the committee reports favorably, it will require 20 black balls to exclude the candidate. If an nnfavorable report is made there will be no election.

The following mining companies have made statements of financial condition on December 31, 1881; cash on hand: Alta, $3,699.53; Alpha, $1,588; Andes, $6,127; Benton Consolidated, $12,984.18; Belcher, $22,888.54; Con. Virginia, $1,926.65; Crown Point, $13,096 89; Hale & Norcross, $75.58; Lady Washington, $2,186; Mexican, $25,260.32; Northern Belle, $59,042.50; Ophir, $42,100; Utah, $11,746.65. The following companies had an indebtedness on the above date: Best & Belcher, $20,328.05; California, $57,426.18; Gould & Cnrry, $14,897.66; Sierra Nevada, $28,171.77.

New Incorporations.

The follnwing company bas been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

ALASKA O. & S. MINING, MILLING AND TRADING CO.—Jan. 4. Location, Alaska Territory. Directors—A. F. Williams, F. J. McWorthy, J. A. Lytle, R. B. Ward, S. J. Marston, J. Lowerie, J. C. Green.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

DITCH.—*Monitor-Argus*, Jan. 2: The ditch for the Alpine gravel claim is progressing nicely. The weather has been all that could be wished for such work.

AMADOR.

WILDMAN.—Amador *Ledger*, Dec. 31: It will be remembered that this Sutter creek quartz claim has been involved in litigation for years. A few months ago a new complication arose by James Morgan jumping the ground over both the other claimants. He has succeeded in holding possession ever since. We are now informed that the long-standing dispute is at last finally settled in favor of Mr. Morgan, whether by compromise or otherwise we bave not learned. Anyhow, he has secured undisputed control, and will start in to develop the mine in good style next spring.

DISCELLANEOUS.—Everything continues bustling at the Walton mine, between Jackson and Middle Bar. The erection of the mill is being pushed ahead, although it will require weeks yet to finish it. We do not hear of any developments of importance in the mine, nor whether there is ore enough in sight to justify the erection of the mill.

DRYTOWN.—Amador *Dispatch*, Dec. 31: The last clean-up at the Potosi mine overpaid running expenses only. The Seaton mill will be in running order by the middle of January, and the company bave a large amount of rock in the dump ready to crush. A large force of carpenters are still at work on the new Loyal mill.

CALAVERAS.

LAMPHEAR MINS.—Calaveras *Chronicle*, Dec. 31: The work of erecting machinery on the Lamphear mine is progressing as rapidly as can be done. Before a great while everything will be in readiness to commence operations. We are informed that the stock is now up to $5 a share, none being sold at a lower figure.

CHISPA.—On Thursday last, Green Lewis, a young man who is mining near Vallecito, picked up a piece of gold weighing over 8 ounces. The mine in which he is working is said to be exceedingly rich.

A CHEAP MINE.—The Mountain Slide mine located on Coyote flat, near Robinson's ferry, has been sold recently to Pietro Ragiadle, by Robert Douglas, for the small sum of $180, together with improvements, consisting of pump wheel, blacksmith shop, carpenter shop and other articles of value. This mine was owned in former years by Capt. Hanford, the builder of the great Salt Spring reservoir. The year previous to the purchase by R. Douglas, it was owned and worked by Bradberry, Smith & Paul, who in the short space of four months, took out of the mine between $8,000 and $9,000, while their expenses were not over $1,300. The party who purchased the mine is fully aware of its value, and would not sell for any small amount. The want of capital to work the mine properly, compelled Mr. Douglas to sell it.

EL DORADO.

QUARTZ MILL CONTRACTS.—*Mountain Democrat*, Dec. 31: D. C. Wickham, of this city, has taken a contract to put up a 20-stamp mill at the Kna mine, Cosumnes township. Our readers will remember that a few weeks ago we gave them a description of this, better known as the "Hite," or "sulphuret" mine, and predicted for it a brilliant future. We are creditably informed that since that time they have hauled to Drytown, Amador county, 90 tons of their unassorted vein matter, which by mill process yielded them an average of $80 per ton. This, and their late explorations, which have demonstrated that their vein or deposit is even more extensive than was anticipated, abundantly justifies them in immediately and as speedily as possible putting up a large mill. Mr. Wickham has also contracted to put up 10 additional stamps, and make other improvements of a substantial character, at the Gopher-Bowlder mine, Kelsey township.

MARIPOSA.

THE RED BANKS.—Mariposa *Gazette*, Dec. 31: The works at the Red Bank bydraulic claim, on the Merced river, which is under the management of Col. Swadley, is all ready for action, but unfortunately there is not sufficient water to prosecute the work beyond one or two hours a day.

MONO.

BODIE.—*Free Press*, Jan. 4: Those who reside in this district look confidently forward to the time when all the Bodie mines will resume operations; when ore in quantities will be found at depth; when their shares will advance in price and give the "boys" a chance to make a few dollars. As will be seen from a detailed account of work performed in several of our leading properties, the managers are hunting for the missing link, so to speak. The Standard is looking well, and some of the crossents which some time ago were in bad ground, are now in a favorable formation. There is ore enough in sight to pay dividends for 2 years, and in the meantime something in the way of a new development will no doubt be made; something that will give the camp a new lease of life. The Bodie Con., during the past week, struck a little ruby silver. This is something new, and it may be the outside sontinel of a zone of silver ore. Ore is still sinking its shaft. The Goodshaw is also sinking, and will soon commence to crosscut.

NEVADA.

SPENCEVILLE.—*Foothill Tidings*, Dec. 31: The lower part of Nevada county, or rather the western portion of Rough and Ready township, is getting again to be lively; something like it was in the early days of the fifties. Spenceville with its copper works, is flourishing like a green hay tree, so far as the town is concerned. The smoke and fumes from the works there, however, do not let any green trees of any kind flourish within reach of them. But there is lots of business going on at Spenceville, and therefore the folks there do not mind a little smoke and a few disagreeable fumes. At the Zinc House and Round Tent House there is a great deal of heavy work done in the way of prospecting for gold hearing quartz ledges. A San Francisco company is now running a tunnel in on the big mountain near the Zinc House, and has a good showing. The ledge is at least 2½ ft thick, and is free milling ore. Years ago ore from this ledge was brought to Grass Valley and yielded by mill process about $15 a ton. The company now running the tunnel will have about 500 ft, average, of backs through the claim.

PLUMAS.

PROFIT OF MINING.—Greenville *Bulletin*, Dec. 28: There is good authority for the statement that a small mill near us is paying $3,000 a month to the owners. They make no fuss about their mill or mine; the firm consists of two or three members, who are themselves practical miners. This shows of what the district is capable. No doubt but a number of such mines will be developed in the near future.

SHASTA.

FRENCH GULCH.—Cor. Shasta *Courier*, Dec. 31: The miners are still on the dry list, except the Lambert mine on Deadwood, which is running day and night and its finances a sealed affair; but a contract given by the company to cut 2,000 cords of wood, and 600 cords on hand, with a wagon road contract to the main road to the Tower House, are solid evidences of success.

SAN DIEGO.

JULIAN AND RANNER.—Cor. San Diego *Union*, Dec. 29: The Eagle mine at the town of Julian, owned by Crays & Duffee, is giving good returns. They have just completed a crushing that paid them $20 per ton. At this time they are getting ready to take out a large crushing.

They have a fine body of ore 20 inches in thickness, in soft picking ground. Mr. Crays informs me that they mine and place on the dump one ton of ore a day per man; that the conveying to mill and milling costs them $4 per ton; and that they can make good wages with ore that yields $8 per ton. The Andy Johnson was the next point I visited. Here I found Mr. Sallor pushing forward a new level to tap some rich ore that he had recently found in the old works. He seemed very much elated with his prospects.

Blue Hill District.—I found Mr. Gardner, of the Gardner mine, getting ready for the water months. He has some very fine ore out. The Ready Relief, in Banner district, is taking the lead. At the mill they are pounding away on ore that shows plainly mf free gold. Twenty men are now at work lo the mine. The slope that is giving the best ore is over 100 ft in length, with a vein of 30 inches in thickness. In all good pay matter. From my knowledge of things, I should think that they have out and in sight, enough ore to pay for the property and a surplus that will allow good wages for themselves. The owners—Messrs. Bally Bros. and Baruch—purchased the property last spring, which was at that time in a dilapidated condition. Now it is a well developed property.

The Humboldt Mine.—At this mine things are rather quiet and mixed. Only two meo are at work in the old level. There is a good 5-stamp mill belonging to this mine, and with some capital and proper management, this should be a good property. The Golden Chariot mill and mine are fast going to decay. Here is a good chance for some parties to start mining. About 5 miles southeast, on the line of the Ready Relief and Chariot, through the brush, I came to the Oriflamme mine, the property of Mr. T. L. Rogers, of Sao Diego. The mill at the Oriflamme is the best free gold mill in Southern California. There are 10 stamps and 3 concentrators; the tables are covered with silver-plated plates, something over 100 square ft; and there is also arrangement for blankets. Every provisloo is made to save the free gold, and also the sulphurets which, Mr. Buck informs me, are about 1½ .. The water supply has been very short, so much so that the mill could not be run more than half the time. For this reason crushing has been discontinued until the next season begins—everything being in readiness when the time comes. The Stonewall mine was the next point to which I directed my steps. Here I found things in a rather tumble-down state, so much so that I did not remain in the mill but a short time, thinking perhaps it would fall next. The past record of this mine is good.

SIERRA.

Closad.—*Mountain Messenger*, Dec. 28: Eureka Con. is closed for the season. The Elutracat gravel mine is closed down for the season.

The Last Chance are sinking at the end of their tunnel. They are down in gravel 30 fs: no bedrock yet.

Reported Sold.—The St. Charles bill quartz property, is reported sold to San Francisco parties.

At the Marguerite mine, at Loganville, things are pushed lively. The hoisting works are under roof. The mill is expected to be running in about one week. One Thousand and One mine at Chips hill, has been running through bedrock for 70 ft, and at last accounts, struck very fine looking gravel. The shareholders feel very highly elated over it. The tunnel of the Blue Gravel Con, is in 700 ft; the last 80 ft have been in bedrock. At last accounts gravel is coming in on the top.

Haskell Peak.—The tunnel of this company is in 1,200 ft. They expect to run 200 ft further and then sink. The bedrock was dipping. They expect to strike bedrock by sinking about 100 ft.

Good Hope.—Quartz is being hauled to the Good Hope mine, and crushing will be made as soon as enough rock is at the mill. The Rising Sun, at Thompson's ranch, has a tunnel in 700 ft. The channel is 400 ft wide, but unfortunately is too high. They expect to start a new tunnel near the river.

NEVADA.

WASHOE DISTRICT.

Yellow Jacket.—*Enterprise*, Jan. 3: The east crosscut on the 2828 level, 275 ft south of sbaft, was ruo 21 ft; grouod, porpbyry and quartz. Gn the 3000 level the east crossdrift from switcb east of sbaft was exteoded 24 ft, making the present length 356 ft; ground hard, with quartz and clay seams. Owiog to the shutting down of the Belcher and Crown Point pumpiog engine for repairs, we have an increase of about 6 inches of water, making about 63 inches (miner's measure) per day.

Union Shaft.—Have completed the 2600 bob pit, are easing timbers in the shaft and repairing 1600 drift to the Sutro tunnel.

Consolidated Virginia.—Still clearing out and repairing drifts and winzes conoecting with the old Consolidated Virginia shaft on the 1000 and 1700 levels.

California.—Are still engaged in cleaning out drifts and winzes conoecting on the 1000 and 1700 levels with the old Consolidated Virginia sbaft. Gn the 2700 level the joint California and Ophir east drift hole has been extended 80 ft.

Sierra Nevada.—On the 2500 level have completed the chamber for winze in No. 2 east crosscut, aod are cutting out chamber for winze in No. 3 crosscut. Oo the 2700 level have completed draio and timbering up in the joint Union Consolidated east drift.

Union Consolidated.—The malo north lateral drift has been extended 80 ft and the main sonth lateral drift the same distance. Have commenced south drift No. 2 aod put the switch plates in place.

Ophir.—Are repairing the joint California drifts and winzes on the 1700 level. During the week 208 tons of ore have been extracted, and 158 sent to the mills. Assays not received from the mills. Bullion to the value of $18,541.68 was shipped last evening.

CANDELARIA DISTRICT.

Northern Belle.—*True Fissure*, Dec. 31: There has been very little change io the appearaoce of the mloo cince last report, all work having progressed io a satisfactory maooer. The average daily yield of ore from the mine has been about 66 tons. The cleaning up at mill No. 1 is nearly completed, aod it will be obut down for the present. Mill No. 2 is doing the usual good work. Bullion shipments for the week ending Dec. 28th, $15,505.41. Shipmente on December account to Dec. 28th, $63,578.31.

Mount Diablo.—The winze from the west drift on the 2d level has reached a depth of 48 ft and still shows the streak of ore mentioned last week. Assays of ore taken from this point go from $90 to $121. The east drift on the 2d level ebows marked improvement, the ore looking very promising for opening. Assays from the ore taken out while running the drift yield from $60 to $98.

Lucky Hill.—Good progress has been made this week in the northeast drift, which is now advanced a distance of 07 ft. A strong ledge of low grade ore has been cut in going the last 10 ft, which may develop into something more valuable.

Princess.—The gallowe frame is nearly in place, and the grading for a blacksmith shop commenced.

CRABB DISTRICT.

Eaole Bird.—Esmeralda *Herald*, Dec. 31: S. Y. Crabb has resumed work on the Eagle Bird mine. He bas run about 30 ft on the ledge, wblch holds its width of about 3 ft, and continues rich in both silver and gold. J. B. Hill discoverod a ledge about 1 mile from the Eagle Bird, which prospects well in free gold, and is about 3 ft wide. From reliable information we predict that Crabb district will shortly be a bullion-producing section.

ESMERALDA DISTRICT.

Work.—Esmeralda *Herald*, Dec. 31: The hille are full of men doing assessment work. Work still continues on the Centennial, pushing the incline down. The ehowing in the bottom speaks well for this little bullion-producing mine. The connection wae made in the Cortez on Christmas eve, and one can now go luto the mine at the upper tunnel, pase down the incline and come out at the mouth of the lower tunnel. A chute will be put in the incline sbaft to run the ore from the upper workings of the mine to the lower tunnel, which is on a level with the ground where the company iutend to build their mill in the spring. Supt. Wells, who, by the way, has proved to be the best manager that ever took hold of a mine in this camp since we have koown it, intends to push developments, and will start the incline down and also run drifts east and west from the lower tunnel level right away. By next June the Cortez mine will have developed and on the dump ore enough to run a 20 stamp mill for an indefinite time, if Judge Wells directs the work.

EUREKA DISTRICT.

The Bowman Mine.—Eureka *Sentinel*, Jan. 1: Since the resumption of work on this property no time has been lost. About 40 tons of ore are being extracted aod shipped to the furnaces every month that average over $100 per ton. Seventeen meo are employed in the mine and above ground, and the mine is paying expenses. M. H. Joseph, who was through the Bowman mine yesterday, says there is a splendid prospect developed on the 113 level. The vein is striking northwest and dipping northeast. The ore carries three-fourths of its metallic value in gold.

Eureka Tunnel.—*Sentinel*, Jan. 3: Another magnificent specimen from the Eureka tunnel was brought down to the company's office on Sunday evening by the assayer, who stated that that kind of rock would assay about $1,000 to the ton. It was taken from a drift ruo from the 50-ft winze statioo. It shows black metal and yellow chlorides in abundance. As far as explored by the drifts the ore body is growing stronger, and every day adds to the value of the mine. Slight trouble is being experienced at the bottom of the winze from impure air, a depth of 80 ft having been reached on the incline in solid ore. Air pipes have been ordered, and will be placed in the tunnel as speedily as they arrive. This will necessitate a furnace, for which the brick, etc., have already been purchased. The north drift of the tunoel is also showing exceedingly well, and a bonanza in that direction is confidently expected to be developed in a short time. The ore so far encountered in this drift shows strong in gold. There are now 20 men employed in aod about the tunnel, and this force will be doubled when the air pipes are laid.

JEFFERSON DISTRICT.

Dodge-Russel.—Belmont *Courier*, Dec. 24: Jos. Enghouse writes from Jefferson that the Dodge-Russel mine is looking well, and will in the near future be classed among the leading mines of that district. He also writes that the Harrison Bros. are extracting very rich ore from the Hillside mine, and are shipping bullion 997 fine. It is a well-known fact that rich mines exist in Jefferson canyon, and all that is lacking is capital to develop them.

LEWIS DISTRICT.

Starr-Grove.—Lewis *Herald*, Dec. 28: The new incline in the Starr-Grove is still being pushed ahead, and the ledge is slightly improving. The stopes are looking well, and considerable ore is being taken out. No difficulty is experienced in keeping the water out. It is the intentioo of the management to replace the present machinery with much larger compressor, engine, pumps, etc., when the mine will be thoroughly explored and large stopes of ore opeoed up.

Highland Chief.—A vein of ore has been struck in the Highland Chief mine in the crosscut. The ore is rich, and about 18 inches in width, and is near the hanging wall, distant about 25 ft from the foot wall.

Betty O'Neal.—But little cbaugo bas taken place in the last week. Sinking is still going on, but as the main shaft is being sunk west of the ledge nothing can oe definitely stated till conoections are made and levels ruo.

Eaole.—The tunnel oo the Eagle mine is being driven ahead as fast as circumstances will permit, and the ledge is improving botb in size and quality.

Chlorine.—The main tunnel was advanced coosiderably during the week, but bas not reached the ledge yet.

MOREY DISTRICT.

Proper Credit.—Cor. Belmont *Courier*, Dec. 24: All the flattering reports cooccrning the coodition of the mines aod wonderful mill operations whereby ores cootaining large percentages of sulphur, zinc blende, antimony, etc., combined are worked tn 90%, producing bullion 940 fine, are true; in fact, I learn from official source that the chlorinations for several consecutive days have attained as bigh a percentage as 07%. Tbe roaster employed is not adapted for the character of ore above mentioned, being ao original White's rotary furoace. It has been improved, however, and by close attentioo aod proper understanding of the manner of treatment proaises above results. The future prospects of the camp are brilliant, aod there is no doubt that when the mines are opened deeper the property will be classed among our regular dividood-paying institutions. Mr. Max E. Bernheimer, formerly conoected with the bankiog business io New York, is the Supt. and general manager; Mr. J. H. Bryden, formerly conocected with mills in Wblte Pine, and late chief engineer at Tybn Con. Co.'s mine aud mill, is foreman of the mill; Mr. A. McArthur, for the past 15 years connected with practical mining on tbis coast, is foreman of the mincs, and to tbese three gentlemen should the whole credit of Morey's present success bo attributed.

OSCEOLA DISTRICT.

No Water.—Ward *Reflex*, Dec. 27: The people of Osceola have entertained the hope for several years past that water would be brought into the placers by Oodby & Co., but have been disappointed. From Dan Morris, who has been stopping in Ward a few days we have learned what's the matter. After purchasing a large tract of placer ground in Osccola, Godby & Co. found they had overreached themselves and that it would be necessary to go elow for a time. Water will come into Osceola after they clean up other things that will not keep as well as their placer interests. They consider their Osceola veoture the best they have taken chances on, but will be unable tn do anything with it until the presoure is relieved in other quarters.

SACRAMENTO DISTRICT.

The Sunrise Claim.—*Silver State*, Dec. 28: Marion Howell and "Poker" Brown have a mining claim in Sacramento district which they call the Sunrise. They have ouok a sbaft over 100 ft on the ledge, which is from 1 to 2 ft wide, and carries ore that assays as high as $1,000 to the ton. "Poker" Brown, who some years ago had a national reputation, was in early days lucky at everything but poker, and made several fortunes which he lost at the game whose name be bears.

TOIYABE DISTRICT.

Toiyabe Mine.—Belmont *Courier*, Dec. 24: Work ie progressing satisfactorily in Toiyabe mining district, and the Tolyabe mine, owned by County Clerk Nicholl, is looking well. Recent assays made of ore taken from different portions of the face of the ledge gave $47.13; $31.42; $15.75; $113 09 and $6.28 in silver. The ledge at present shows a width of 8 ft, and the hanging wall has not yet been reached. Undoubtedly the mines of tbis district will in tbe near future attract the attention of capitalists and mining men.

ARIZONA.

Silver District.—Yuma *Free Press*, Dec. 31: Work on the main shaft of the Black Rock is being continued, and depth rapidly attained. Stoping is going ahead all along the tunnel drift. Pickeubaok is pushing his contract on the Silver Glance, with much energy. Tom Oilchrist is levelling off ground for the erection of two buildings, the lumber for which will arrive by the next steamer. Pacific City is becoming the center of attraction, and is growing up like a muebroom.

Tonto Basin Items.—Arizona *Democrat*, Dec. 28: From Mr. Sam Hill we learn that in the Golden Wonder, now owned by Burdett & Chileon, there has been made another rich strike at a depth of 160 ft. The ore body is 3 ft wide, with a 20-inch seam of $75 ore. They are putting up 4 arastras, to be run by steam power, wblch they expect to have started in about 2 weeks. The Excursion mine is now down 150 ft, with an ore body 4½ ft, which they claim will mill $25. Having struck a large flow of water, they cannot sink any deeper until a pump le put in. The Gowan, owned by Oowan, Bacon and Snow, is the bese claim of the camp, and is a magnificent property. They are down on it 105 ft, and are now drifting. The whole face of the drift is in solid ore, 5 to 6 ft thick, exceedingly rich specimens of which can be seen at the shop of Mr. Hill. What enhances the value of this property, as well as its claim as a big mine, is its facilities for working the ores, a large stream of water running within 100 yards of it which can be had for the running, a 50 stamp mill with water power. Altogether the outlook for Tonto Basin is certainly brilliant and will add in time another bright jewel to Yavapai's cluster of rich mines.

Old Pat.—*Pinal Drill*, Dec. 31. Belonging to Messrs. P. S. Empey and Niemeyer, is situated about ¾ of a mile northwest from the King, near Peachville. They have a shaft about 20 ft deep and have struck a large vein of rich ore, carrying copper and silver, assaying $547.50. There appears to be a considerable body of it. This mine is in the foothills, on 1 of the numerous veins that run parallel with the great Josephine ledge, from the Rosalie to the Pike. All the locations in the belt show great improvement by this years' assessment work, as greater depth is attained, and it leads to the inevitable conclusion that all that is needed on this belt, is to go down, in order to show up a score or more of rich mines.

Cole District.—This is a new district, situated 15 miles in a northwesterly direction from Pinal, and 8 miles from People's cattle ranch, which is about 10 miles north of Whitlew's station. Recent discoveries have caused great excitement here. The Uncle Ben, Uncle Dave, Black Spider and World, all adjoining claims, have been located by Messrs. Thos. Graves, B. W. Kellogg, John Cole and Witrock. The lowest assays, from the surface rock, give $290 in silver and a trace of gold. Theso are contact veins, in a sycnite and porphyry formatioo. The finders came into town for tools and provisions and have gooe back to develop their valuable property.

Cliff.—Is situated in the town of Bello Air. Messrs. O'Farrell and Moyer, the owners, are having a shaft sunk, under contract, which is now down 24 ft, in rich chloride and native silver ore. It is oot known how wide the ledge is, as it covers more than the width of the shaft. They have plenty of ore that assays over $1,000.

Tyndall District.—Arizona *Journal*, Dec. 31: Tyodall district is located on the southern slope of the Santa Rita mountains, is connected with Tucson by a good highway 00 miles lo length, and since the late road improvements, it is passable for large freight teams. The mines are longer known than any in the Territory, work having been commenced on them as far back as the time of the establishment of the Spanish missions by the Jesuit padres. Later on, io 1856 and 1861 work was continued by Heintzelman, Wrightson and Grosvenor, but was discontinued on accouot of Indian outbreaks. Security of life and property having been established by the energetic means of the Territorial goverument, work on the various claims was re-commeoced about 5 years ago, and by dint of enterprise and hard licks, the deserted camp occupies to-day the most prominent page in the miolog history of Southern Arizona. Two railroads are rapidly approaching the camp and will establish depots within 8 miles. The A. T. & S. F. passing through the fertile valley, the Sonoita, a mountain stream with water capacity for 1,000 stamps or more, will connect with the 1st of May, 1882. Wood, water aod pasture are abundant and in close proximity to the principal mines. The climate is delightful both summer and winter, and owing to sufficieot altitude is entirely free from the malarial diseases prevalent lo the lower districts. Labor can be procured here at the rate of $2 per day, and wood can be loaded at furnace or mill for $3 a cord. Building material to the shape of timber is found on the north side of the Santa Ritas, and white sandstone about ¼ of a mile from camp in exhaustless quantities. Amoogst the principal mines in the district are the group owned by Charles Atschul, Mark Ezekiela and the Lully brothers, comprising the Major, Beckie and Charley, Oakland, Southern Pacific and the Lully.

Orano Central.—Tombstone *Epitaph*, Dec. 1: Have commenced to put in a station at the 500 level, new shaft. Crosscut on the 300 level in 200 ft, having cut the ledge, which is 25 ft wide. The ledge looks well and assays are favorable. South drift, east vein, on the 500 level is in 46 ft. The ledge at this point is very rich. The stopes are looking well and turning out 100 tons daily from the old works. They have a reserve of 1,000 tons at the mill, which is daily increasing.

Tombstone M. & M. Co.—They struck a new body of ore in the northwest workings about 10 days ago, upon which they have gone down 35 ft. It is from 2½ to 3 ft wide. This is an important strike, as it is entirely new ground and disconoected from any heretofore known ore bodies. Are shipping from 8 to 0 loads to the mill per day.

Contention.—Timbering still being done on the 400 level preparatory to stoping. Stopes all looking well and turniog out the usual amount of ore. The machinists are overbauliog the engine at the new shaft, at which work will be resumed early this month. Are sending 70 tons of ore to mill per day.

Woronoco (San Diego) M. Co.—On Friday a very important strike was made on the 266 level, 80 ft from the shaft. The ledge at this point is nearly 3 ft wide, and is yieldiog all pay dirt. The ore is carbonato distributed through a decomposed quartz, small pockets of which give a very bigh assay. The upraise is showing up some fine looking ore.

Head Center.—The mine is being worked in the usual quiet way and sends ore to the mill sufficient to keep it running at its full capacity.

COLORADO.

Will Start Up.—*Register-Call*, Jan. 3: Sylvestor Nichols last evening received a dispatch from Mr. George W. Mabee, now in New York, to let contracts for the grading off for a sbaft building to be placed over the Clay County mine, Lake district. This property, of which Mr. Maybee bas a lease, is owned by Hon. Jerome B. Chaffee. Another one of the idle mines and former producers will add ber share to the gaiety of the scene.

Williams Fork.—George Applegate arrived io this city last evening from the mines on Williame Fork, Grand county. He experienced great difficulty in crossing the range, which he accomplished on enow shoes. He reports work progressing slowly but surely on the veins partially developed last summer and fall. Those who were fortunate in getting their tunnel approaches under cover, are developing most of the time. Mr. Applegate, after visiting friends near Fort Collins, will return.

The Bobtail M. Co. have raised the pumps from below the 600 levele, and will develop the mine above that point.

Tropic.—From Mr. John Gilbert, who was a visitor to Central last evening, the information is gained that the Tropic mine is looking better than ever in the level workings.

New Mill.—The new 5-stamp mill just completed at the Eureka foundry, was started up this morning.

Purchased.—It was reported on the streets last evening that the United Gregory mining company had purchased that portion of the Gregory lode belooging to the New York and Colorado Co., east of and adjoining the former company's property.

Mr. W. B. Brown, an old resident of Nevadaville, who has been taking in the San Juan section and the Gunnison and Lake county mines has returned, after an absence of about a year.

IDAHO.

Gold.—Wood River *Times*, Dec 28: A rumor is in circulation here that the Mayflower, Eureka and Jay Ould mines, of Bullion, have been sold to ex-Oovernor Tabor and 2 other equally prominent Colorado capitalists, for the sum of $450,000, ¼ of which has been paid down, the balance to be paid by the 1st of July, 1882. The owners are men who thoroughly understand mines and mining, and it is therefore not probable that they have sold for $450,000 property believed to be worth 3 times that amount. The price paid by the Toledo Co. for the Ouy mine, of Rock creek, was $13,000 cash. Messrs. Garrard & Campbell, former owners of the Guy, have just received the coin. They are now prospecting out Snake river way.

The Strahorn Claims.—While here last summer, Robert E. Straborn, chief of the literary bureau of the Union Pacific Railroad, purchased a controlling interest in 5 claims situated on Bald mountain, opposite Hailey, and put a force of men to work driving a tunnel by contract. Appreciating the great value and advantage of depth in mining operations, Mr. Strahorn determioed to start his tunnel so as to strike the ledge at a depth of at least 250 ft. This tunnel is now in about 185 ft, and the ledge is expected to be cut in about 60 ft more.

MONTANA.

The Stevens.—*Inter-Mountain*, Dec. 27: Work on the Stevene mine is pushed ahead with vigor. The mine is looking well, especially in the east level from the main shaft. This level is now advanced on the vein for a distance of 220 ft east from the 200-ft station of the main shaft. In the end of the level the ore is rich, showing plenty of native and wire silver, with the lowest assays running 100 ounces to the ton. Sinking winzes on the vein, both in the east and west levels, as deep as the water would permit, shows an improvement in the size of the vein and in the quality of the ore. At the west, or whim shaft, a winze has been sunk from the 90 level on the ore velo. The ore assays 80 ounces in silver to the ton. At the 200 level in this shaft a crossent has been driven across the vein, showing ore of a similar grade to that found at the 90 level. There is a large amount of ore now opened up in the Stevens.

Morning Star Mine.—At the Morning Star mine an excellent quality of ore is coming from the west level, which is in a distance of 170 ft from the 220 level. The last assays of ore from this level run 69 and 128 ounces in silver and $18 and $25 in gold to the ton. Four stopes have been raised in this level to the bight of 21 ft each. The mine is yielding from 8 to 10 tons of ore daily, which amount can be easily increased. The water, although heavy, is under easy control. During the last week 80 tons of the first-class ore from this mine was hauled to the Colorado smelter, where it will be reduced.

NEW MEXICO.

Mineral City.—Blue Canyon *Drill*, Dec. 20: With an abundance of mineral in paying quantities, plenty of coal, wood and water for the asking, a town site surveyed and recorded, post office and mail line established, the district populated with an experienced, pushing class of miners, who believe in developing their claims, and are reluctant to sell them, what's going to prevent a boom in the spring?

Consolioated Claims.—And oow Mineral Hill, not to be outdone by older and more preteotious camps, is to have a joint stock company. The owners of 10 claims—all located io a buoch at and near the junction of Blue and Gold creeks lo the Blue canyon—in connection with several Eastern capitalists, have decided to pool the several properties, form a company, and issue stock to the amount of $1,000,000. It is understood that about a quarter of the stock has already beeo spoken for, and that money enough is insured in advance to enable the gentlemen to commence developmeot at an early date. The John Hancock, a 40-ft cut and tunnel; the Ellen Wood, a 20-ft cut and incline; the Optic, a 30-ft cut; the Providence, Little Frank, Robert Newton, Surprise and Holy Terror claims, are all reported io on the pool, and are so situated ou either side of the canyon, that their ores can be deposited at the junction of the creek at a merely oomioal expense.

Notes.—Rocky Mountalo *Mining Review*, Jao. 3: Mineral City is to have a oew 25-ton smelter. Rincon district is furoishing excellent specimens of ore. Many gold placer claims are staked off in the Black Range. A recent rich strike was made in the Socorro district, giving an assay of $710 per ton. Several important sales have been made in Grant county during the last 2 or 3 weeks. The smelters at Cerrillos are being pushed to completion as fast as material can be secured. It is claimed that White Oaks is situated oo a coal bed, with rich gold lodes sandwiched between lava beds and rich placers. There will be a large amount of development work done in the Silver City district, and we predict that the output of bullion during the comiog year will be very large. Good Hope mine, Carbonateville, with several others has been sold to a London, England, company, who will proceed at once to develop them, and to erect buildings, offices, etc. They will probably also sink a new shaft. A new assay office will be erected, and Prof. Robinson, of Las Vegas, will have the management. The Clifton copper mines are said to be far superior to those of Lake Superior. They are situated oo the dividing line between New Mexico and Arizona. M. Lesinsky & Co. have built a 20-inch gauge road to their main works, at a cost of $30,000. These mines may prove a big bonanza, and will add a large amount to our country's resources.

Taos District.—Activity in the various mining camps in Taos is grea., aod the progress of development really astonishing. Claims are changing hands aod new companies are being organized every few days. Santa Fe men are investing heavily on the Arroyo Hondo, which camp is acknowledged to equal any silver camp io the Territory. The small amount of development in the Staple mine is an evidence of what there is in that camp. At a depth of 45 ft the mineral runs from 500 to 1,000 ounces in silver, and some pockets run as bigh as 87% silver. There are other claims on the same lode equally as rich, on which little development has been made, but the surface indications of which are even richer than the Staple.

In Spring Gulch, about 7 miles from the Arroyo Hondo, work is progressing with a fine prospect in sight. Messrs. Cooper & Bridgee are driviog a tunnel to cut 2 big lodes that show galena on top, and when into the seam will be 100 ft underground.

On Copper Hill work is lively. This camp is attracting more attention from Eastern capitalists than any of the others. Several claims have recently been sold to Eastern men at good figures, and on 1, purchased from William Anderson, a contract for sinking a hundred ft shaft has been let.

On the Rio Honno all is quiet at present, and little work is being done; nevertheless, claims are changing hands at high figures to Eastern men who will rush development shortly.

The Allen coal banks are being worked vigorously. Several other veins have been discovered lately and are being opened up. Taos county will astonish its neighbors when the coal fields are fully developed.

OREGON.

Notes.—*Democratic Times*, Dec. 30: A great deal of rain has fallen during the past week, and the miner is happy.....The minere of Oalice creek have an abundance of water and are improving their opportunity.....From W. H. Benner we learn that piping has been commenced in earnest at the Centennial mine.....M. M. Obenchain and Mr. Mullen will work 1 of Ben Miller's claims on Sardine creek, this winter.....The ground is well soaked with water and but little more rain is needed to start all the miners agoing.....Excellent rock is being taken from Geo. Schumpf's ledge in Willow Springs precinct. There is plenty of it in sight.....The Josephine mine, over which Bybee, Robineon and others are having much litigation, will lie in *statu quo* this season. .....Enoch Gale and John Cowan who have rented Jas. G. Birdsey's mines on Birdsey creek, have commenced work after getting everything into ship-shape.....The hydraulic mines, with the exception of the Squaw Lake Co.'s, are at work with a good supply of water. The latter will also be running as soon as the reservoir is completed and the new pipe placed in position.....From J. W. Howard, of Calice creek, who is spending the holidays in Jackson county, we learn that Green Bros. are taking out an unusually fine quality of quartz, which is supposed to average $100 per ton. The ledge is nearly a ft and a half wide and constantly getting better. The tunnel has proved a success. We are glad to hear this..... Our Waldo correspondent writes: Miners of Josephine county are generally at work.....T. F. Dugan, at the Carron mine, is sluoing and washing double the amount of ground got off in former seasons.....The Mount Pleasant Co. have located 80 acres of ground that prospects well. Their ditch is under headway and will be completed by March.....Wimer & Simmons are getting off a great amount of dirt, running night and day with 8-hour shifts.....DeSellee & Co., at Scotch gulch, have already enough ground run off to keep them cleaning up for several months and will start their elevator soon.

A Great Triumph.

The History and Features of the Studebaker Wagon.

As an illustration of American industry, wrought out and brought to the most perfect system that has ever been devised for the manufacture of the modern wagon in any portion of the world, we produce on this page a cut of a portion of the celebrated manufactory of the Studebaker Bros. Manufacturing Co. at South Bend, Ind. The upper cut, showing a structure whose exterior has the appearance of some grand opera house or bank building, is only the repository and manufactory for the landaulet, barouche, phæton, buggies of every description, and light and fine vehicles that are used by our merchant princes, hackmen, horsemen and pleasure seekers in city, town and country, plantation, ranch and farm, from Maine to Mexico. The exquisite finish, excellence and artistic taste displayed in this branch of their business is such that large repositories have been established in Chicago and other great centers for the sale and display of this class of goods.

The lower engraving represents the main portion of the Studebaker Bros. Co.'s Wagon Works, which now, with buildings, sheds, drying houses and accessories, cover 27 acres of ground, to which they have added the last year 58 acres more. The main buildings are four stories high, built of brick, and in architectural design and finish, with turrets and smokestacks, represent a scene of beauty and progress that is part of the history of this country. As we view this labyrinth of American industry, we fail to grasp its immensity, unless with yard-stick and pencil we measure and count. There are over 17 acres of flooring; over 10,000,000 bricks in the main buildings; over 1,000-horse power in steam engines; over 2,000 ft. line shafting, not including countershafts; over 4 miles of belting, some of which is 36 inches wide, and over 1,200 men, molding and fashioning the Studebaker wagon, with sunlight by day and the electric light by night. Steadily has the demand and sale of this wagon increased; and as surely preparations have been made to meet the demand. The last year, 1880, 26,000 wagons were sold, and this year, 1881, will exceed 28,000—the largest number of vehicles manufactured and sold by one firm in one year in the United States or any other country.

It is marvelous beyond precedent in the history of a wagon manufactory to see in the packing and shipping department and side tracks at South Bend, Indiana, trains of railroad cars built by the Studebaker Bros. for their own use (larger and wider than the ordinary baggage car), filled with boxed carriages and heavy wagons of all kinds, and marked "Afghanistan, Quartermaster's Dep't, British Army," "Egypt," "Syria," "Sandwich Islands," "Australia," "Cuba," "Paris," "San Francisco," and to towns and cities in all parts of this country.

In the year 1852, Clem Studebaker and Henry Studebaker opened a small wagon shop in South Bend, Indiana, in which they managed to turn out two farm wagons during that year, one of which is in use now. During 1874 their loss by fire was 2,400 wagons, and property valued at $300,000; but the indefatigable brothers soon built on a larger scale than before. In 1880 the Studebaker Bros. Manufacturing Co., consisting of the following brothers: Clem Studebaker, Pres.; J. M. Studebaker, Vice-Pres.; J. F. Studebaker, Sec'y, and P. E. Studebaker, Treas., had facilities for, and did build and finish, a wagon or carriage on the average for that year at the rate of 100 a day, or one every five minutes, counting eight working hours a day. Their combined capital at the commencement was $66. At this time it is millions. For these fabulous results there must be a cause, and it may be well for us to stop and inquire what it is. In this connection we shall refer back to the first "Studebaker" wagon ever built.

John Studebaker, the father of the present Studebaker Bros., after six years of an apprenticeship in Gettysburg, Pa., in the wagon trade, commenced business for himself, and built a new wagon for farm purposes, whose contour and style has only been improved by his own boys. The wagon was made as well as intelligent mechanical labor could make it. It laid the foundation upon which he amassed a considerable fortune which was swept away by the betrayed confidence of a friend. Through these dark days he trained the sons in the art of knowing the strength of wood when combined with iron and making a neat, tasteful and easy running wagon that would last in use a quarter of a century. That knowledge, to which has been added all that inventive genius, science and modern improved machinery could do, has made their name a household word, and their achievements in keeping with the grandest triumphs in art, and the great inventions of the 19th century. In view of the possibilities and grand results of well directed and intelligent mechanical labor in this country, as shown by this great American firm, who started in life as poor, practical mechanics and for over a quarter of a century have steadily continued in the same business only to swell into greater proportions and develop the modern perfected wagon—no motto could be more appropriate than that over the main door of the largest wagon manufactory in the world.

"Established 1852."

"Labor Omnia Vincit."

"Studebaker Bros. Mfg. Co."

It is often said by men who have used the Studebaker wagon, "I have not had $5 expense on my 'Studebaker' in five years," "That Studebaker gearing of mine has worn out two bodies and is good yet." "I save one-fourth of a horse-power on every 'Studebaker' wagon I use." Having this reputation we will endeavor to show why and how it was obtained:

1st—The best of timber of every class, and especially that of Indiana, is used.

2d—Every stick of timber is seasoned from five to seven years, and the entire woodwork is saturated in boiling oil to render it impervious to moisture.

3d—The wood passes triple inspection and is tested by machinery and worked by selected and the best skilled mechanics in the world, who work with such precision that if you gather up distinct parts of the wagon made by different persons, they will be found to fit with almost the nice precision of the works of the Waltham watch.

4th—The patent bevel-edge projecting tire eaves the paint on the felloe, and consequently on rocky roads and ruts protects the wheel.

5th—The skeins are set by a patent skein

STUDEBAKER CARRIAGE WORKS, SOUTH BEND, INDIANA.

setter, which takes exact pattern of the inside of the skein to which the axle is to be fitted, thereby making a true fit and a perfect running wagon. These parts are also made of selected iron, very heavy and are fitted to such an exactness that the farmer of Sacramento and Stockton can exchange wheels with impunity.

6th—The Studebaker is the only wagon in which the slope shoulder spoke is used, which are driven in by a "Tom Sayers" trip hammer and the tires shrunken on by lowering it all at once on a horizontal platform; making a wheel that will last as long and longer than other parts of the wagon.

7th—The hubs are all bored true, then the skein boxes are turned on an iron lathe to fit, and pressed in by hydraulic pressure of 150 tons, insuring a perfect joint and allowing no oil or water to soak in, as the case is when the boxes are wedged in.

8th—All the thimble skein wagons have the Studebaker patent skein and truss axle which greatly strengthene the axles. These improvements cannot be found on any other wagon.

9th—In painting these wagons only the pure lead and best oil is used; no cheap minerals or adulterated lead are allowed on a Studebaker wagon.

10th—Every piece of timber and iron or steel is subjected to inspection and scientific tests by the most skilled mechanics, and if not up to the standard is rejected.

11th—They make the best wagon that improved patents of their own or that can be used to advantage, and will not allow any wagon to pass from these works unless it bears the old and reliable brand "Studebaker Bros. Manufacturing Co., South Bend, Indiana."

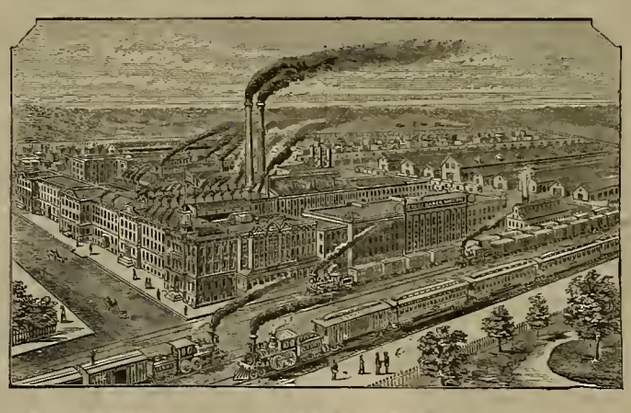
12th—The Studebaker wagon is the acme of perfection, perfected by the combined mechanical talent and inventive genius of two generations.

It has been and is the ambition of this great American firm to make a wagon that was adapted to the wants of every locality, and that they could have the whole world for a market. They have traveled in different States and countries to gain information as to the requirements of different localities. Over 20 years ago the vice-president, J. M. Studebaker, was a resident of California, where he as a practical mechanic fashioned, built and studied the best manner to construct a wagon for the Pacific coast. His store of knowledge was carried back where improved machinery could be had to fill this demand. From time to time the different members of the firm, J. F. Studebaker, Sec'y, and Supt. of the carriage department; P. E. Studebaker, Treas., and Clem Studebaker, Pres., have visited this State. The president has made frequent visits, extending as far back as 1868. During the past season he traveled extensively on this coast as far north as British Columbia and as far south as Mexico, and with prophetic vision saw that the varied industries, resources and future greatness of this western empire would demand increased carriage facilities.

The large and increased sale of Studebaker wagons in California for 1881 and demand induced the Studebaker Bros. Manufacturing Co. to enlarge the Pacific coast branch, and selected San Francisco as the distributing point, with agencies in all the principal cities and towns.

A repository was opened at 31 Market street, and a large warehouse secured near the railroad depot, 4th and Townsend, for storing their goods. The Studebaker railroad cars were immediately switched up to the five-story shipping and storage apartments at South Bend, and their own cars were filled with all classes of vehicles for the "Pacific Coast Branch House."

The fiat has gone forth and will soon be passed along the line from Alaska to Arizona and to the Islands of the Sea, that the teamster, farmer, drayman, hackman and horseman can have a Studebaker wagon. That landaulet and rockaway, buggy and barouche, three and four spring and platform spring wagons, farm and freight wagons, wide and narrow tires, header trucks—in fact, everything that runs on wheels and enters into the development of this Western slope, will be kept in stock, and is now ready for distribution at 31 Market St., to those who wish to secure a wagon, cart or carriage made by the "Studebaker Bros. Manufacturing Co., South Bend, Indiana.



STUDEBAKER WAGON WORKS, SOUTH BEND, INDIANA.

We have endeavored to show how the Studebaker wagon is made, its superiority and growing demand for their modern perfected wagon. Their success and the results that have been attained by following one rule, viz: They make a safe, durable, easy-riding, light-draft vehicle, adapted to every business and suited to the taste and requirements of a progressive age; and sell them at *fair* prices.

The Studebaker wagons and carriages have entered the broad field of competition at county and State fairs; the United States Exposition, 1876; World's Great Fair, Paris 1878, and won first prizes and silver medals, but the best award is the increasing demand each year in the industrial fields of America.

The French government has a Studebaker army wagon on exhibit in the great National Military Museum in Paris.

As a nation we are proud of our national achievements in science, art, mechanical excellence, and improved labor-saving machinery. No better illustration of the way the genius of Americans meets the necessities of this age, can be found than the triumphs of the Studebaker Bros.

In the history of this great American firm, who have followed one line of business for 30 years, and are bound together and as closely allied in their prosperity as in their boyhood days, we have a commendable example of American progress and enterprise. If so much has been accomplished in the broad field of life by these four brothers, whose only legacy from sire to son was mechanical skill, industry and strength of purpose, in so short a time, every American youth and middle-aged man can take heart and with confidence move on where broader fields and better opportunities for honest, well-directed mechanical labor are brought to view as each new railroad penetrates the stillness of the forests or opens to industry the rich valleys of the West.

Lectures to Young Mechanics and Apprentices.

Color Blindness.

On Thursday of last week, R. D. Johnson, a student in the Pacific Medical College, delivered one of the course of lectures being given to young mechanics and apprentices in the hall of Capt. McNevin's Nautical school. The subject was "Color Blindness." After a description of the eye and the *tholamus opticus*, the seat of color in the brain, the lecturer said: "This subject of color blindness has recently attracted a good deal of attention among railroad and steamship men. It is especially important that every officer of every ship and every railroad train should be examined for color blindness, and with crews of ships the examination should not cease upon the sailing of the ship from port. The master of every ship should continue the examination of his men from time to time, and especially after sickness or any great excitement, for a very great sympathy exists between the body and the optic nerve. Any arrest of the development of the *tholamus opticus* by a blood-clot in the artery supplying sustenance to that particular portion of the brain, or through any other cause, may cause color blindness, and is probably the most common cause. If it is caused, however, by a defect of the eye itself, it is incurable. Red and green are the two colors most confounded, and the cause in such cases is generally congenital. Medical statistics show that one man in every 20 is color-blind. The blindness may be hereditary, or acquired, but in either case the eye seldom presents any abnormal appearance. Dalton, the celebrated chemist, could not distinguish pink from blue, and thought that red was blue and yellow. He was not aware of his own blindness for a long time, thinking that there was some confusion in the nomenclature, rather than in his sight."

When the lecturer spoke of Dalton he took a small pointer and attempted to point out the pink and blue on a screen of color bars over the blackboard, but hesitated, and at last said: "Well, Dalton could not distinguish, and I hardly can." As his pointer hovered uncertainly over the line of colors, one of the class stepped forward and said kindly, "that's the pink." A shout of laughter greeted his efforts, as he had pointed out the yellow. Mr. Johnson continued: "Dalton thought that the vitreous-humor of the eye absorbed the red, and gave it a blue tinge, as that is the color of the vitreous, but this is not so, as can be demonstrated by looking at the spectrum colors through a blue lense, all of the colors, if the sight is perfect, remaining distinguishable, though tinged with blue. The seat of color in Dalton's brain was found to be defective. This is a fault that can be remedied, if the color blindness is discovered when the subject is young, by the special development of that portion of the brain. The use of yellow lenses for color-blind people is recommended, as it reduces daylight to an artificial light, to which the sight of color-blind people responds best. The explanation of a case where a bar of red is placed between bars of blue and green, and not seen, is that the rays forming the red light are not reflected by the retina, but absorbed and allowed to be carried on.

"The effect of vapors, such as smoke or fog, on ship lights, is in itself a study. We know that vapor between us and the sun make the light of the latter look red or yellow, according to their character. Proportionately the same cause produces the same effect on a ship's light. Where a steamship, with foresail set, is running before the wind, the smoke, pouring from her funnels, is deflected by the foresails in such a manner that it passes between the ship's lights and any one looking at them from another ship. I would recommend, therefore, that steamships do not carry a foresail when running before the wind. If the truth were known, many an appalling accident attributed to carelessness as the cause has been the result of color blindness on the part of some person upon whose perfect sight the lives of thousands rested once too often. Urgent measures speedily applied are required, now that means of testing for color blindness are known."

The Italian hydraulic claim at Loganville, Sierra county, has proven a veritable bonanza for the owners. About $150,000 have been washed out since its discovery some six years ago.

The Engineer.

Some Great Engineering Projects.

The shortening of commercial routes by means of ship railways and ship canals seems to be the great ambition of the engineers of to-day.

In addition to the De Lessepe ship canal at Panama, the Eads ship railway at Tehuantepec, the Florida ship canal, the Cheapeake and Delaware ship canal, the Cape Cod canal, and others in the interior of this country, there are several other important projects of like natnre under way or in prospect in various parts of the world. The old project of connecting the bay of Fnndy and Baie Verte, on the Gulf of St. Lawrence, across the Isthmue of Chignecto, has lately taken new form. It is now proposed to make the connection by a ship railway 18 miles long, thus making a short cut for navigation between the United States and the ports on the St. Lawrence gulf and river, and saving the long and dangerous voyage around Nova Scotia.

The projector of the ship railway, Mr. H. G. C. Ketchom, writes us that the plan grew out of a desire to save lockage and a deep channel in the design of the Baie Verte canal. His first plan was to lift vessels hy hydraulio power on pontoons and then float them throogh the canal. The idea then occnrred that they might as well he lifted to the surface of the ground and hauled across the neck of land on rails. The road may be level and perfectly straight from end to end. The plan has been submitted to the Dominion government and is favorably entertained. Mr. Ketchum has issued an interesting pamphlet relative to the project, which may be oonsidered at greater length elsewhere.

Across the ocean, the constroction of the tunnel under the British channel, connecting England with the continent, is being prosecuted with an energy which is indicative of ultimate sucoess, and thus far no obstacles have been encountered to make the nndertaking a difficult or exceptionally hazardous one.

In France the connection of the Atlantic with the Mediterranean by a ship canal, to save the long and stormy voyage around the Spanish peninsula, is under serious consideration, and the Council-General of the Seine have just adopted a resolution approving of the project.

Tne ship canal aoroes the Isthmos of Corinth, in Greece, to shorten the route to Constantinople and the ports of the Black sea, has, we helieve, heen definitely determined opon.

In the far east a bolder and more important project is in contemplation, with a view to shortening the commercial route to China and Japan hy 600 miles or more. At the head of the Malay peninsula is the Isthmus of Kiaw, connecting Upper with Lower Siam; and hy the cutting of a ship canal at this point, about 30 miles in length, the need of sailing around the peninsula might he ohviated. At Kraw, the Malayan peninsula, which stretches southward for 500 miles to Singapore, is at its narrowest hreadth, and the distance across from the side of the Indian ocean to that of the China seas is fnrther decreased hy the existence of natural waterways for some distance inland from both shores. From side to side it is no more than 50 miles, and the Pakchan river, on the western coast, and the Htssay on the eastern, afford the ready means of forther redocing it. The distance, therefore, over which it wonld he necessary to cnt a canal would prohably not exceed 30 miles. The neighboring districts are known to be fertile and to contain great mineral wealth. A tin mining company has been established for more than 10 years at Malewon, on the Pakchan, and gold has been found in the neighboring stream of the Lenya. So far as known, the engineering difficnlties are not of a stupendous oharacter, and political drawbacks and considerations fortunately do not exist.

The French appear to have taken the lead in proposing this important commercial short-cut, and, if the opinion of the London *Times* is well founded, the government of British India will not decline to actively participate in its execution.—*Scientific American.*

Working Under Water.—We learn from the Des Moines, Ia., *Leader*, that the Wabash Railroad Co. have a diver at work in the construction of their hridges across the Des Moines river at Des Moines, who remains under water five hours at a time, digging and shoveling mud from the hottom of the river. He is dressed in a diver's costume and is let down into a large cylinder. Promptly at 7 o'clock in the morning he goes down and shovels a large tnh full of dirt at the hottom of the cylinder; the dirt is hauled to the top and domped on the outside. The iron cylinder is eunk deeper as he removes the dirt from the inside. At the present time he is working ahout 10 ft. under water. He is hauled up at noon for dinner, afterward roturne to work and remains until 6 o'clock. Two men turn the wheele which work an air pump that supplies the man under water with air hy means of a ruhher tuhe, which is attaohed to the diver's helmet. Ahont a dozen of the large iron cylindere are to he sunk in the bed of the river, and several pilinge driven inside of them deep into the hottom of the river, and then they will he filled with 500 lbs. of rock and grout and cement, and these will furnish the foundation and support of the bridge.

Borax.—Last week 2,500 harrels of California horax were sold in New York at 12 cents per lb.

Useful Information.

How to Prepare Sardines.

Sardines are fonnd in great abundance, at certain seasons on this ooast, and we believe a few have been put up in California oil, and have proven very soperior. We see no reason why the preparation of sardines for the market might not be made a large and lucrative bnsiness here. At any rate perhaps some of onr readers along the coast might like to experiment with sardines for their own ose.

In view of these facts, it may he of interest to some to peruse the following, somewhat detailed, but, we believe, accurate description of the method of preparing sardines in France. The sardine heing a very delicate fish, the utmost attention is directed towards having tbe fish as fresh as possible, and as near as can be to the factory where it is to be oanned. Factories are, therefore, rarely situated more than two or three hours distance from the place where the fish are caoght. The fish are placed on stone tables; women plock off the heads, which operation removes the entrails. The fish are then placed on wooden slats and allowed to drip; are slightly salted, and remain over night. Nsxt day they are again slightly salted, and allowed to dry. The old, and moet approved, method of cooking sardines is to place them in vessels filled with hot oil, where tbey are cooked. When done, they are put into a wire basket to drip. At exactly the right point of cooking, the scales remsin on the fish, which is desirahle. If the cooking has been oarried too far, or if the fieh are too fat, the scales drop off, which impairs the value of the canned fish. A period of from five to six minutes ie ahout the right time for the cooking in hot oil. The fish are then allowed to drip carefully, with the head part downward; when they have cooled, they are placed on tsbles and arranged by women in the well-known tin hoxes in which they come to the market, the oil heing dipped from harrels into the boxes. The oil being more valuable than the fish, efforts are made, without too much crowding, to put as many sardines in a hox as poesihle. The lids of the hoxes are then soldered, and the hoxes are then heated in suitahle receptaclss hy means of steam. The sooner this heating of the hoxes takes place, the hetter. The temperature of the water in which the filled boxes are placed is at first cold, and the steam is gradually introduced. This second heating is sometimes carried on for an hour and a quarter. When the boxes are sufficiently heated, they are sometimes allowed to cool in the water, partioolar pains heing taken always not to move the hoxes too much. Another and cheaper method of preparing sardinss is to cook them without oil in circular ovens. The after processes are the same. Sardines are most highly prized when not too large in size. Those of most approved size are worth six francs per thousand to the fishermen, while the larger ones only command ahout four francs. As sardines are migratory, a shoal of fish remaining at a fishing station for a week and then going off, the largest canners of sardines have sometimes two factories, situated at different localities on the coast. The fishing and canning season occupies about three months, from the middle of May to the middle of August. Durıng the other months the sardine factories engage in the preparation of other food products.

How Can You Tell a Good Cigar?—Tbey used to say that a good cigar could he known hy the light brown specks on it. These were made hy worms, the story was, and the worms were epicures in tobacco, and would touch only the hest. But the chemists soon found a way of simulating these worm specks. So that spoiled the test. Then there was no other guide hut the ashes. If these hurned white, the cigar was good; if not, had. But the enterprising tohacconists soon found a way to make the vilest cabbagenia hurn as spotlessly white as the best Havana. Another test gone. Finally the makers of choice cigars pnt a little red label aroond each. This was thought to be something which would always be a sure guide. And so it would he, hut nnfortunately some of the manufacturers have, hy a strange mistake, put the labels on the cahhagenias as well as the Havanas.—*Boston Transcript.*

To Stain Dried Grasses.—Bunches of dried grasses can readily be dyed of a great variety of tints hy dipping them into an alcoholic solution of the various aniline colors. Some of these have a beantiful rose shade, othere red, hlue, orange, purple, etc. The depth of color can he regulatsd hy dilnting the dyeing solution with water or diluted spirits. When taken out of the dye, the grasses should be exposed to the air to dry off the spirit. Then they are ready to be arranged into hunches or houquete, hut not until they are quite dry. The pink saucers sold hy most druggists contain enough rose dye for two ordinary houquets. The hest way to use it is to wash it off with water and lemon juice.

To Protect Roofs.—It is claimed that a coat of lime, ealt and fine sand or wood ashes, applied as in whitewash, will make an ordinary shingle roof 50% safer from lire through falling cinders, and will also proteot the shinglee against rotting from exposure to the weather and against warping. Indeed, the more weather-beaten the shingles, the greater benefit they derive.

Cement for Glass.

It is well known that when gelatine or gloe is treated with bichromate of potassium, it becomes insoluble after being exposed to the light. Where the exposure has been prolonged, the gelatine is not even effected hy hot water. Thie peculiar change is known to deuend on a chemical change taking place in the materials, the gelatine exerting, under the influence of the sunlight, a reducing action on the chromic acid of the bichromate, reducing the latter to the condition of chromio oxide. This change is olearly iudicated by the change of the material from an orange red to a dark green oolor, the latter being a characteristio indication of the formation of chromic oxide.

This behavior of bichromated gelatinc, ss we have several times pointed out, is the basis of a number of photographic, photolithographic and photo-engraving processes, which have been brought to a high state of perfection. It is not so well known, however, that bichromated gelatine, rendered insoluble by exposure to light, makes an excellent cement for glass. This, however, is asserted to be the fact, and as it may prove useful to some of our readers, we give the following deecription of the mode of preparing and ueing the material for this purpose:

One part of a very pure and colorless gelatine is dissolved in 15 parts of water in which 3 parts of hichromate of potassium has previously been dissolved. This must be done in a dark place, or at least in a room illuminated only hy a weak candle or gaslight. And the mixture itself must be carefully kept from sunlight, hest in a hlack bottle in a dark room. To cement fractured glass fragments together, the edges are first thoroughly cleaned, then slightly warmed, and coated with a *very thin* coating of the cement, in a dark room. The pieces are then pressed together, and, if at all possihle, kept under preseure (hy tying with cord, wire, etc), and then exposed to direct sunlight. If the edges have been thoroughly adjusted and the cement applied thin, even hot water will not separate the pieces. Opaque objects are not so thoroughly cemented together by this mixtore, since the rays of the sun cannot strike the fractured edge throughout its whole extent.—*Manufacturer and Builder.*

Be Your Own Right-Hand Man.—People who have been holstered up and levered all their lives are seldom good for anything in a crisis. When misfortune comes they look aronnd for something to cling to or lean upon. If the prop is not there, down they go. Once down, they are as helpless as capsized turtles, or unhorsed men in armor, and cannot find their feet again without assistance. Soch silken fellows no more resemble self-made men, who have fought their way to position, making difficulties their stepping stones and deriving determination from defeat, than vines resemhle oaks, or sputtering rushlights the stars of heaven. Efforts persisted into achievements train a man to self-reliance, and when he has proved to the world that he can trust himself, the world will trust him. It is unwise to deprive young men of the advantages which result from their own energetic action hy "boosting" them over obstacles which they ought to surmonnt alone.

Good Health.

An Important Question—How do You Sleep?

One of the most important things to know ahout any man npon whom you are going to place any dependence, is how he sleeps. Sleeplessness may sometimes be involuntary. There may have been some shock to the man's nerves which has made him insomnolent; hut sleeplessness is more frequently voluntary. Men choose to push their studies or their work into those hoors when they should sleep. It does not matter for what cause any man may do this, the mere fact of not sleeping spoils his case. He may spend his nights in the theater, in the study, or in the "protracted meeting." It will make no difference; the result to the body will he the same. The sleep was not had, and for that the man must pay.

One man may do with a little less sleep than another; but, as a general rule, if you want a clerk, a lieutenant, a lawyer, a physician, a legislator, a jodge, a president or a pastor, do not trust your interests to any man that does not take eight good eolid houre of sleep out of every 24. Whatever may he his reason for it, if he does not give himself that, he will snap eome time juet when you want him to be strong.

The intellectual and moral connections of sleeping have, I think, not heen sufficiently appreciated. Men and boys have been praised for "burning the midnight oil." Now thie "midnight oil" is a delusion and a snare. The etudent who is fast asleep at 11 o'clock every night, and wide awake every morning at 7 o'clock, is going to surpass another student of the same intellectual ability who goes to hed after 12 and rises before 5. In sleep, the plate on which the picture is to he taken ie receiving ite chemical preparation; and it ie plain that that which is the hest prepared will take the bst picture.

Men who are the fastest asleep when they are asleep, are the widest awake when they are awake.

Great workers must be great resters.

Every man who has clerks in his employ ought to know what their sleeping habits are. The young man who is up till 2, 3 and 4 o'clock in the morning, and must put in his appearance at the bank or store by 9 or 10 o'clock, and work all day, cannot repeat this process many days without a certain shakiness coming into his system, which he will endeavor to steady hy some delusive stimulos. It is in this way that many a young man begins his couree to ruin. He need not necessarily have been in bad company. He has lost his sleep; and losing sleep is losing strength and graces.—*Rev. Dr. Deems.*

The Fresh Air Habit.

Esrly impressions are very enduring, and can make useful habits as well as evil ones n sort of second nature. In order to forestall the chief danger of in-door life, make your children lovesick after fresh air; make them associate the idea of fusty rooms with prison life, punishment and sickness. Open a window whenever they complain of headache or nauses; promise them a woodland excureion as a reward of exceptionally good hehavior. Save your best sweetmeats for ont-door festivals. By the witchery of associated ideas a hoy can come to regard the lonely shade tree as a primsry requisite to the enjoyment of a good story book. "Only the movement of my feet seems to set my brains a-going," ssys Rousseao. And it is just as easy to think, debate, rehearse, etc., walking as sitting; the peripatetic philosophers derived their name from their pedeetrian proclivities, and the Stoic seot from their master's predilection for an open porch. Children who have heen brought up in hygienic homes not rarely "feel as if they were going to be choked" in unventilated rooms, and I would take good care not to cure them of such salotary idiosyncrasies.

Every oheervant teacher must have noticed the innate hardiness of young boys, their unaffected indifferance to wind and weather. They seem to take a delight in braving the extremes of temperature, and, by simply indolging this *penchant* of theirs, children can be made weather-proof to an almost unlimited degree; and in nothing else can they be more safely trusted to the guidance of their protective instincts. Don't he afraid that an active boy will hurt himself by voluntary exposure, unless his chances for out-door play are so rare as to tempt him to abnse the first opportunity. Weather-proof people are almost sickness-proof; a merry hunting excursion to the snow clad highlands will rarely fail to counteract the consequences of repeated surfeits; even girls who have learned to brave the winter storms of our northwestern prairies will afterward laugh at "drafts" and "raw March winds."—*Dr. Felix L. Oswald, in Popular Science Monthly.*

How to Sleep in a Sleeping Car.

To sleep well in a sleeping car:

1. Get a berth in the fore part of the car. This is because the pure air comes in at the front end and windows and goes out at the rear end and windows. General Butler always gets the extreme frontberth. I always take the front opper berth. My reason for taking the upper berth is because it is freely ventilated and away from the hot pipes.

2. Have your herth made op head toward the engine. This will keep all drafts of air from your head and prevent taking cold. If the car is very tight put a lead-pencil nnder the window at your feet in case of lower herth; or, in case of the upper herth, open the hind sky-window at your feet.

3. Fix your pillow in one oorner of the herth and your feet in the other. By laying crosswise you will not roll in your herth.

4. If you are nervous do not drink water, milk, coffee or any liquid substance for three hours before retiring. The reason for this will be ohvious to any one.

External Use of Castor Oil.—The London *Medical Journal* gives reports from various practitioners who have found purgative results to follow the use of castor oil as an external application. One writer states that he has frequently applied this oil to his abdomen, under spongiopiline or water-proof material, in cases where the usual way of administering by mouth seemed undesirable, and with the most satisfactory consequences. In a case of typhoid fever, also, half an ounce of caetor oil was applied in this manner, under a hot water fomentation. The effect of this heing, as represented, to relieve constipation and tympanitic distention that had been present, without undue purgation or any irritation of the bowels.

Toothache.—There should be a remedy for toothache in every house where there are children. The following is reported by medical authority ae reliable: Take of carbolic acid (saturated solution), chloral hydrate (saturated solution), paregoric, fluid extract of aconite—of each one ounce; oil of peppermint, half an onnce; saturate a piece of cotton aud pack tightly in the cavity.

A Dangerous Hypnotic.—It appeare that bromide of potassium, which is so extensively used as an antidote for sleeplessness, is largely composed of lead, and those who employ it are expoeing themselves to lead poisoning. Thie statement is made hy a German chemist.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:
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Passing Events.

As we write, the welcome rain is falling which gladdens the hearts of the people in an assurance of a prosperous year before us. This, our first week of the new year, opens auspiciously, and from all quarters comes news that the people expect a continuance of the Divine favors which have been showered upon us during 1881.

Our only drawback is the unfortunate litigation entailed on the settlement of the debris question. It is greatly to be hoped that it will before long be definitely settled. The question has now been introduced in Congress, so that if the nation takes hold of it, we shall have a solution before long.

The great Gold Run suit still runs along at Sacramento. Very many witnesses are being examined, and the taking of testimony has absorbed much more time than was expected.

The MINING AND SCIENTIFIC PRESS enters upon a new volume to-day, an event worthy of note by all our readers. We are endeavoring to constantly improve the paper and keep it to the front with the progress being made in science, mechanics, mining and kindred interests.

We shall shortly give an exhaustive review of the mining interests for 1881, with such statistics from different localities as we are able to gather.

THE State Fish Commission has received from the East 50,000 Eastern trout and 500,000 whitefish eggs for distribution in the waters of this State. Twenty thousand of the trout eggs are being hatched at San Leandro.

THE London *Times* says the Chileans, who obtained a victory in a just war, will not be inclined to submit to dictation unless the American army and navy are largely reinforced.

A New Volume.

This is the initial number of Volume XLIV. of the MINING AND SCIENTIFIC PRESS.

We have earnestly endeavored during the past year to make as interesting and valuable a paper to miners, mechanics and other industrial readers as possible, and flatter ourselves that we have been successful.

The PRESS has now attained a ripe age, and its usefulness has increased with its years. No miner or manufacturer can afford to be without the representative industrial publication of the Pacific coast.

The coming 12 months promise greater development in the mineral progress of the coast than has been experienced in any past year. There has been a great revival of the mining industry, and the area over which it is carried on is greatly widened. No one interested can afford to do without a journal which represents so great and growing an industry. Manufactures and mechanic arts are also gaining a better foothold among us; and to these we devote considerable space.

We shall still continue to gather information from all reliable sources such as will be interesting to our readers, and endeavor to make our paper as practically useful to its progressive readers as possible.

Of course, to be able to carry on a journal like this we need the encouragement and support of the industrial classes in the community. We want old subscribers to renew their subscriptions and new readers to send in their names. Our old subscribers can help us greatly by bringing to the attention of others the merits of the PRESS. In doing this they benefit themselves also, since with increased patronage increased expenditures may be made on the paper. The beginning of a volume is a good time to begin being a subscriber; tell your friends that and encourage them to help us.

We wish our many subscribers and advertisers a Happy New Year, and hope that the coming twelve months will treat them so well they will all be with us at the commencement of 1883.

Mining Partners.

The law provides that upon the failure of any one of several co-owners of a vein, lode or ledge which has not been entered for patent, to contribute his proportion of the expenditures necessary to hold the claim or claims so held in ownership in common, the co-owners who have performed the labor, or made the improvements as required by law, may, at the expiration of the year, give such delinquent co-owner personal notice in writing, or notice by publication in the newspaper published nearest the claim, for at least once a week for 90 days; and if, upon the expiration of 90 days after such notice in writing, or upon the expiration of 180 days after the first newspaper publication of notice, the delinquent shall have failed to contribute his proportion to meet the expenditures or improvements, his interest in the claim by law passes to his co-owners who have made the expenditures or improvements.

The following forms are those which will be the proper ones to use in such cases:

Notice of Forfeiture.

———County, ——— ———, 188—.

To—(names of all parties who have record title to any portion of the mine). You are hereby notified that I have expended———dollars in labor and improvements upon the ———lode (dike or the claim), as will appear by certificate filed———, 188—, in the office of the Recorder of said county (or district), in order to hold said premises under the provisions of section 2324 Revised Statutes of the United States, being the amount required to hold the same for the year ending———, 188—. And if within ninety days from the service of this notice (or within ninety days after this notice by publication), you fail or refuse to contribute your proportion of such expenditure as a co-owner, your interest in said claim will become the property of the subscriber under said section 2324.

(Signature).

NOTE.—At the expiration of 180 days, this notice should be recorded with the affidavit of the newspaper publisher, that the same was published for the period of ninety days, together with the affidavit (Form 4) of the party signing the notice to the effect that one or more of the co-owners named in the published notice have not paid their share of the expenditure. This completes the record title.

Affidavit of Failure to Contribute.

———of———, *County of* ———, *ss.*

———, being duly sworn, deposes and says, that for the year ending———, 188—, he expended at least ——— dollars in labor and improvements upon the ——— lode [or ——— placer claim] (here describe the claim), to hold the same under the laws of the United States and of this——— (district, Territory or State); that due notice thereof was personally served upon ———, co-owners, on the ——— day of———, 188—, (or was duly published in the ———, as appears from the affidavit of the publisher thereof); and that ——— ——— (of the said) co-owners have failed or refused to contribute their share of said expenditures within the time required by law.

———

Subscribed and sworn to before me this———day of———, 188—.

———

The party who contributes his proportion of the *required* expenditures, can retain his interest in the mine. If a party fails to contribute his proportion of the *actual* expenditures upon a mining claim, the remedy must be sought elsewhere than in the General Land Office.

Drift Mining.

Drift mining, next to hydraulic mining, is the most important branch of placer mining at present followed in California. In fact, it is almost the only branch, comparatively a small amount of river-bed mining in northern California being done, and the primitive methods of argonautic days—the pan, rocker and ground sluice—are now relegated to the Chinese, washing over old tailings, or to the working during the spring of the small areas of untouched surface diggings.

Drift mining is the term used among miners to define and describe that variety of placer mining in which only a comparatively small portion of the gravels or "wash"—that portion containing most gold in proportion to its bulk—is removed by what is technically known as *drifting*, from underneath worthless or comparatively barren ground, and brought to the surface. There this gravel is washed, either directly through sluices and the gold caught in the riffles, or where it is hard and cemented, it is crushed in stamp batteries and treated exactly as free-milling auriferous quartz. The underground work is very similar to that of coal mines, as distinguished from the working of metalliferous vein deposits of any kind.

Drift mining works under more natural disadvantages, which will further on be particularly noticed, than hydraulic mining, and the cost of opening and fitting a drift claim often reaches a very high figure. Laboring under the disadvantages it does, it would not be followed to any extent were it not that there exists a certain class of gravel deposits which, from their location and the amount and position of the gold in them, cannot be worked successfully by any other method. By drifting, from a well-opened, good mine, a profit commensurate with the risk can be obtained. As a pre-requisite to a thorough knowledge of drift mining, is essential a comprehensive understanding of the phenomena and peculiarities of the gold-bearing

Gravel Deposits.

These may be considered of two general classes, in origin, primary and secondary. The latter, the less so in importance, consists of the bare and channel deposits of the present streams and were almost entirely worked out years since. The shallower and more accessible beds were worked from the surface down to the bedrock by the usual methods. From the deeper and less accessible deposits only the richest portion of the gravel, that lying on or immediately above the bedrock, was taken out by drifting and worked. These gravels are usually loose, or very slightly cemented, and were consequently easily worked.

As distinguished from the preceding, the great body of gold-bearing gravel of this State consists of the ancient river channel "wash" of pliocene times, now for the most part buried deep down under volcanic ashes, and trachytic and basaltic lavas. The causes leading to the formation of these old river channels, their filling up first with drift and gravels carrying gold, sands and clays, then their final obliteration and covering up with lavas and other volcanic detritus, and the subsequent formation of the present river system, it is not necessary to consider here. The present streams cross the old channels usually at a sharp angle, the latter having generally a somewhat more southern course, though this is not by any means universally the case. Again, the present streams have eroded through the lava and drift, and far into the underlying country rock, deriving the greater portion of the gold in their gravels from the older channels, where they have been cut through and washed away. Occasionally we find one of the existing rivers flowing over the drift-filled bed of a pliocene river, as, for example, the Feather river at Oroville, in Butte county. In general, however, the old channels are higher than the present, and the difference in elevation increases as the summit of the Sierras is approached. A consideration of the above and the physical geography of the placer mining region of California shows the present rivers flowing in deep canyons and between mountain spurs or ridges, locally known as "divides," and in these "divides," oftenest far above the rivers, the discontinuous fragments of the old channels, sometimes almost parallel to the present rivers, but usually crossing diagonally from canyon to canyon. The thickness of these gravel beds varies from a few feet, or even inches, to several hundred feet, and as regards width, the extremes are even further apart, in fact, hardly determined, as the auriferous drift gravel sometimes covers the whole surface of the country for miles, with no well-defined channel limits. Great variations exist in the hardness of the superincumbent lava, where it occurs, the gravel and the underlying country rock. The gold found in these channels varies from the finest flour-like fineness, requiring undercurrents and quicksilver to save even in part, up to masses so large that they sometimes run into the tailings and are lost, the riffles in the sluices failing to hold them. The gold is, however, almost invariably most concentrated in the gravel lying immediately on the bedrock.

Conditions of Drifting.

Where the conditions are favorable, that is, where the gravel deposit is deep and extensive, and the gold more or less disseminated through it, where a sufficient head of water for washing, and fall or dump enough to carry off the tailings can be had, hydraulicing is the method of working employed. The presence of a lava cap, pips clay strata or a hard and cemented variety of gravel resisting the slacking action of water and air, even after partial disintegration by bank blasting, render unprofitable the hydraulicing of some of these deep channel deposits. Many of the present hydraulic mines were first worked by drifting, and in many instances yielded a larger profit then than now. By far the greater portion of these channel gravels are shallow and buried under several hundred feet of lava, and can therefore only be worked by drifting. The old streams, like the present, had bars and eddies, rapids and falls, and the same peculiarities in the distribution of the gold in their gravels and sands is observable. Both have barren stretches, and pockets, leads and crevices of extreme richness, only in the present streams these latter are found from external indications without much difficulty; in the buried streams they are sought for almost blindfold, the most experienced practical miners being often at fault.

The conditions of drift mining ground may be briefly stated as follows: A divide between two deep river canyons, the sides cut into by small ravines tributary to the main streams, the top sometimes several miles wide, mesa-like and comparatively level, and having only one main slope in the direction of the ancient buried rivers. This top is usually composed of lava several hundred feet thick, and somewhere underneath this lava cap and between walls of true country rock termed the "rims," the channel of an ancient river, sometimes with little or no gravel in its bed, sometimes with gravel two or three hundred feet thick; sometimes barren of gold, but more frequently found to be wonderfully rich in that metal. Under all of the above, granites, metamorphic slates, limestones, sandstones, serpentines and talcose rocks. The problem of drift mining is to find the position of these channels, to open up and to prospect them with the least possible expenditure, and, if a lead of pay gravel is found, to work it at the least possible cost.

(TO BE CONTINUED.)

The Ward Propeller.

It may be remembered by our readers that a year or more ago we gave some account of preliminary trials on a steam launch on Lake Chabot, and small tug in this bay, of the peculiar propeller designed by Mr. John B. Ward, of this city. The results of the trials referred to were so satisfactory to the inventor, that he determined to continue them still further with more carefully taken data, in order to settle convincingly the superiority of the wheel. Accordingly, he went East last summer, where he would have an opportunity to put the wheel in competition with those of best design, and on boats where speed was a prime object; all the small steamers in this bay being designed for towing purposes only.

Mr. Ward employs for his propeller peculiarly-formed elastic blades united to the hub, upon which are formed flanges upon the arc of a circle, so as to give the greatest strength at this point. These blades are formed circular, but are with a straight-line face, and of a substance of an elastic nature, the outer edge being in the arc of a circle, so as to increase the efficiency of the blade. The hub is cast or wrought, and the blades are secured in the slots on the flanges on this hub by suitable bolts, but in a peculiarly strong manner. The flanges on the hub are turned to the pitch required for the blade. The blades are formed of elastic steel, without any curves or hollows, a perfectly flat surface being presented to the water.

The form and proportions adopted by Mr. Ward give the maximum strength with minimum weight, and the maximum effective straight-line-face area of blade thrust, with the necessary strength of flange and grips. The elastic blades may be removed and interchanged readily, and a great deal of the jar on engine and machinery is avoided.

Mr. Ward's theory on this subject is about as follows: "The curved-line propeller blade, in ordinary use, breaks the head of the resisting water column, throwing it into foam and producing slip. The straight-line-faced elastic propeller makes a clean cut on the head of the resisting water column, and produces no foam. The reaction of the water column on the wheel is instantaneous, continuous and effective, the propeller blade receiving the reactive effect of the resisting water column on the same surface that gave the original thrust; hence there is no slip, but, on the contrary, the reactive effect of the elastic blade, when its modulus of elasticity if properly adjusted in reference to the resistance to be overcome, will cause the vessel to overrun the distance usually allowed to the pitch of the propeller. As a wheel is a continuous lever, so is this propeller a continuous even wedge or inclined plane, giving great efficiency."

Mr. Ward had, when he first went East, some difficulty in obtaining exactly the kind of craft on which to try his wheel. He finally heard of the steamer *General Franklin*, which had been built by Handren & Robbins for Mr. Darkin, agent of the Colts Arms Co., of Hartford, the boat being named after the President of that company. She has what is known as the disk engine, a newly devised type, which is particularly adapted for propellers, being a rotary one. The boat is 48½ ft. over all, 8½ ft.

beam, and drawe 3½ ft. of water aft with the skag. Her performances as to speed have surpassed those of any boat around New York, taking into account her ability and stability. A Ward propeller was made and put on her and while on her she was sent off somewhere, and unluckily got on a reef. The propeller wheel was knocked against the rocks and considerably battered and bent but not broken. She was hacked off with it finally, and the wheel really saved her, for an ordinary cast one would have been broken. Her old wheel was put in again next day while the Ward one was being repaired. In starting out away from the battery, the cast wheel just touched the stone steps, and away went one of the blades.

After this experience, Mr. Ward made further trials with his wheel and it is on the boat now. With it she backs as well as she goes ahead and steers very straight. In an hour's run with the same steam pressure, the log showed nine-tenths of a mile greater velocity than with the Delamater wheel, and an economy of coal of 25%. The Delamater propeller is recognized as the best speed propeller in the United States, Mr. Ward tells us. It is the invention of Ericsson. It is the perfection of the curved-line-face wheel, but it backs badly.

The following report contains the memoranda and trials of the Ward propellor, in competition with the Ericcson (better known as the Delamater) propeller, in New York bay and on the Hudson river, in August, November and December, 1881, on the steam launch *Gen. W. B. Franklin:*

One trial was made with a 32 inch, two-bladed wheel over a 12-mile course. In this, Mr. Dickie, of the Albany Iron Works, designer of the launch, reported that the Ward wheel sent the boat over the course in about the same time, with an economy of about 20% of fuel.

The other trials were made with the greatest care, using Bliss & Co.'s patent log; the coal was carefully weighed, and an even pressure of steam at 120 lbs., by the gauge, maintained. The course was over the Hudson, along the Jersey side from Fort Lee wharf to the Piermont wharf, distant 14 miles, and return. Capt. Freeman, master of the yacht, attended to the log himself, and signed a certificate to the following effect:

"On November 26th the boat ran, with a 35-inch three-bladed Delamatar wheel, 25⅞ miles in 3 hours 17 minutes, burning 300 pounds of coal; steam pressure, 120 pounds. At the time there was a flood tide and strong SW. breeze."

"December 17th the boat ran, with a 34-inch three-bladed Ward propeller, 29⅞ miles in 3 hours 44 minutes, burning 280 pounds of coal, with 120 pounds pressure. This trip was made on a strong ebb tide, stiff breeze ahead and heavy swell, causing the wheel to 'race' considerably."

"There were various trials, but these were the principal ones. The result shows an economy of over 25% of fuel, greater speed, less vibration, much superiority for backing, steering and stopping in favor of the Ward wheel."

Inventors and Progress.

One who signs himself "Inventor," writes in answer to some strictures passed upon inventors by a Stockton paper, claiming that inventors are idle, designing persons, who are always endeavoring to live without work, always looking for the opportunity to entrap some unwary capitalist into investing money in their inventions. Such remarks applied to the inventors in general is a base, ungrateful slander. One has only to look into the present working of any department of the arts or manufactures to learn the service of invention to industry. Every item of progress, from the rude processes and appliances of the ancients, has been the work of the inventor. As a rule, the improvements have cost a great amount of experiment and effort and actual outlay to those who have achieved them. There is, of course, now and then, a happy thought; but the average of effort for each invention is very great. It is but natural that the successful laborer in the field of invention should desire to enjoy a part of the fruits of his labor, and the people of the United States and other civilized countries, have decided that his claim is a just one. What would farming be without the triumphs of the inventor? Contrast the labor it is now possible to accomplish by one man's labor with what was done by a man in the early days. Contrast the gang plow with the forked stick, the self-binding reaper with the sickle, the thrashing outfit with the flail. People who decry the service of the inventor to the industries are relics of a bygone age. They have no part or parcel in the progress of the day. Agriculture has enjoyed her full share of the inventors' attention, and while she has been advanced, they, in turn, or many of them, have become enriched. It is a case of useful labor well requited; and there is much more of it to do. Excellent as are our agricultural tools and machines, no one can tell what farther improvement may come to them through the inventor's earnest efforts.

PERSONS who have visited the mines at Highland speak in glowing terms of the outlook of that place. A number of the prospects are looking very promising, having well defined ledges of good ore. It is likely that there will be another town built up at Highland next spring.

Ancient Mining.

Probably in no branch of any long-established industry have there been such marked advances in the appliances in use as, in the past quarter of a century, in the mining industry. The main improvements have been in hoisting and pumping machinery; and in the latter, particularly, every possible device for cheapening cost has been introduced. It is interesting to look back to see what used to be done to relieve mines of water, and what systems are even yet in vogue in countries where time and labor are of little moment. The following from the Arizona *Star*, taken in connection with the engraving we present, will be of interest:

The methods in vogue among the ancients for the development of mines were in many respects far different from those in use at the present time. In the country to the south of us, the descent and ascent of shafts were made by means of notched logs. These were from 20 to 30 ft. long, extending from level to level. The logs or ladders were climbed by the sure-footed miners, the Aztecs, and more recently by the Indians, who were engaged in the dislodgment of the precious mineral. The ore was placed in rawhide bags containing about half a bushel,

ANCIENT METHOD OF TAKING WATER FROM MINES.

this same being rested upon the back, while it was held in position by straps extending across the shoulders, united in front, and fastened through its own weight upon the forehead.

If a mine were overflowing with water, the troublesome fluid was removed in these bags, in the same manner as the ore, by the miners, who tediously climbed the notched poles, and whose notches answered the place of wider steps. The ore was removed in a manner almost as tedious. Fires were built against the walls of the mine, and as their surface became calcined, the incinerated portions were dislodged by stone hammers. The melting was equally as cumbersome, being effected with charcoal and bellows. Yet mining was profitable under these crude methods. It is not surprising, therefore, that wonderful reports continue to reach us of the richness of the abandoned old mines of Sonora, which, with the introduction of modern machinery, worked by energetic and experienced Americans, will soon astonish the world with their rich productions.

In the early days of the Comstock, we have seen these notched poles in use in the Mexican mines in this city; also the rawhide sacks. However, they used picks and shovels, and blasted out the ore instead of burning it out. The ore was worked in plastras, and by the patio process—indeed the patio process was in use here for years, and not alone by Mexicans. Horses were used for treading these patios to stir up the pulp, and in a short time the poor beasts presented a pitiable appearance. The bluestone in the pulp took all the hair off their legs and covered them with sores, while the quicksilver salivated and poisoned. It was said that the horses became so charged with mercury that it oozed from their eyes,

Technical Education.

In the course of some remarks at the last meeting of the California Academy of Sciences, the President, Prof. Davidson, made a few suggestions upon the introduction of elementary science in our public school system, and upon the formation of schools of trade, art and commerce. The professor believed that the present school system has spoiled tens of thousands of artisans; but it has, in a measure, only repeated the experience of other countries. To state its results mildly, it may be said to create a disposition in the pupils to avoid those occupations which demand manual labor, and to seek those easy berths, where some one else must do the work. It creates a false standard of manly merit. It causes a multitude of incongruous subjects, and lacks completeness and thoroughness in any one of them. Whoever has had a varied experience with young men grown up from the ordinary public schools, will be astonished at their lack of knowledge of the fundamental principles which underlie their workmanship. They have, in general, an amount of undigested, incoherent material, which their teachers have christened knowledge, and which their experience considers applicable for any sin every pursuit. For example, one of the commonest wants of pupils throughout the country is their inability to draw upon paper any plan of roads with which they are familiar, any sketch of the plainest machine of the day, and much less to convey upon paper any idea which looks to an improvement or an invention in machinery or construction.

Professor Davidson felt safe in saying, from his experience, that not one person in a hundred from our public schools can give you an off-hand drawing of any plain object with an approachable degree of accuracy as to relative dimensions or perspective. This he did not think was the fault of the pupils, who, as a rule, are naturally quicker and brighter than the youth of Europe, but it is the inherent weakness of the system—an evidence that we are not doing our duty to our boys. These deficiencies in the present system can be corrected only in a measure, because time is required to mold and develop the proper system of trade and art schools, of evening and navagation schools suitable for this side of the continent, at least; whilst we can certainly at once engraft upon our methods the proper study of elementary science, and especially connected therewith the freehand drawing which is the *sine qua non* in every school of the active nations of Europe. For our young who are to build up the industrial supremacy of this country, we need not cram them with foreign languages, which in few years must be pressed aside before the irresistible progress of the English-speaking races; and it is a thousand times better that the boy, who is to honestly earn his livelihood as an artisan, shall be a fair draughtsman than a fair fiddler. If his special talents point to music, than let that faculty be thoroughly cultivated, but do not waste means in spoiling a good carpenter or in endeavoring to misdirect special aptitude. The classics, music and the fine arts have their high places and their humanizing functions in modern civilization. So has the bridge-builder, the miner, the engineer and the contractor. Life is too short for us to repair the errors of early education. The State loses by the misapplication of talent. We need not willfully throw our wealth into the depths of the Pacific. There are many important conditions attached to this subject of science-teaching and of trade and art schools, especially when we contemplate how extensively great corporate bodies are gathering into their hands the manufacturing processes of the country, and apparently swallowing up individual efforts. But each year the demand for skilled labor increases, and we must meet the difficulties of the problem as the number of factories increase.

Academy of Sciences.

Annual Meeting and Election.

The annual meeting of the California Academy of Sciences was held on Monday evening last, President Davidson in the chair.

The following were elected members of the Society: Life members—W. S. Wood, Edgar Mills, J. D. Fry and Squire P. Dewey. Resident members—C. Mitchell Grant, Ignatius E. Thayer, John Dolbeer, Isador Cohn, A. Crawford, George M. Josselyn, William R. Bentley, Augustus G. Elliott and Hypolite Dutard. Honorary members—Prof. F. V. Hayden and Major J. W. Powell, United States Geological Survey. John G. Harding was proposed for membership. The Council of the Academy presented the name of Charles Crocker for life membership in return for his generous gift and services rendered to the Academy. The proposition was received with applause and the election was unanimous.

The judges of election, who had been busily engaged all day, read their report. It showed that all the old officers and trustees were re-elected to serve during the present year. They are: President, George Davidson; Vice President, Justin P. Moore; Second Vice President, H. Herman Behr; Corresponding Secretary, Samuel B. Christy; Recording Secretary, Charles G. Yale (of the MINING AND SCIENTIFIC PRESS); Treasurer, Elisha Brooks; Librarian, Carlos Troyer; Director of Museum, W. G. W. Harford; Trustees—B. B. Redding, Thomas M. Madden, George E. Gray, James M. McDonald, Ralph C. Harrison, Wm. Ashburner, Robert E. C. Stearns.

The property of the Academy consists of its library and museum, a lot on Market street near Fourth street, a lot, corner of First avenue and Mears street, also a half interest as residuary legatee in the estate of James Lick. The "Crocker Scientific Investigation Fund," is invested in registered Southern Pacific Railroad 6% bonds with interest payable half yearly.

Mr. Redding stated that the Trustees desired to express their thanks publicly to Mr. Charles Wolcott Brooks, the Secretary of the Trustees, for the gratuitous work performed by him in their behalf.

W. G. W. Harford, Director of the Museum, read his report, showing the annual expenses of the Museum to be about $2,889.13

Carlos Troyer then read the Librarian's report, showing 388 valuable works received from individuals, home and foreign societies.

Elisha Brooks read the Treasurer's report, showing $91.07 cash on hand.

Mr. Yale, the Recording Secretary, reported that during the year 10 life and 21 resident members were elected, 19 members were dropped for non-payment of dues, leaving 179 resident and 105 life members in good standing—total, 284. The gain during the year was 12. Twenty-three regular and two special meetings had been held.

Mr. Yale, as Secretary of the Council, read a report from that body, deploring the fact that the publications were not being continued, owing to a lack of funds. The following memorial to Congress was also offered by the Council for adoption by the Academy, and, on vote, it was adopted.

"*Memorial to the Honorable Senate and House of Representatives, in Congress Assembled:* The California Academy of Sciences of San Francisco respectfully represents to your honorable bodies that the varied resources of Alaska which should form an important factor in the commerce of the Pacific coast, are at present unavailable, owing to the want of accurate information regarding the navigable waters and the topography of that region. That the partial surveys heretofore made at intervals by the United States Coast and Geodetic Survey have been so limited as to result in far less benefit to trade than is desired by our merchants and mariners. This Academy, therefore, earnestly requests your honorable bodies to appropriate such funds for the continuance of the United States Coast and Geodetic Survey within the Territory of Alaska as are asked for by the Superintendent."

The President read his annual address, in which he spoke freely of the necessity of the introduction into our school system of branches of elementary science. We will shortly give this paper in full.

Dr. Harkness made some remarks on microscopic fungi, exhibiting specimens under the microscope.

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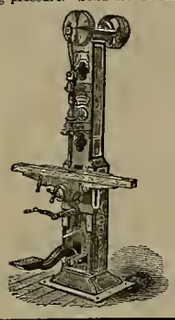

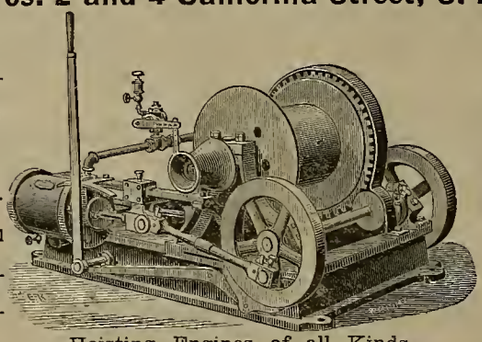

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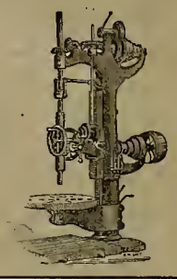
- Ballard's Oak Tanned Leather Belting.



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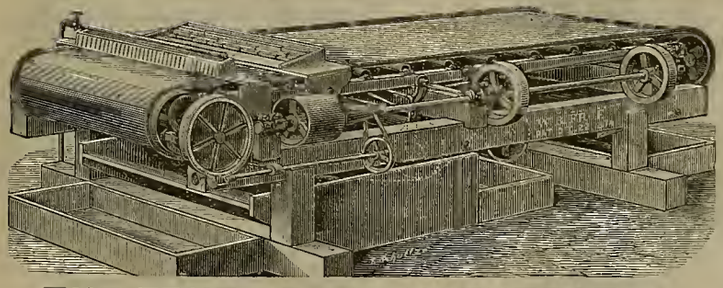

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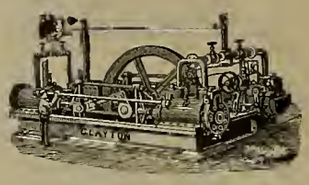

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Judson Powder

IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞Triple Force Caps and all Grades of Fuse.

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WORKS ORE WET OR DRY,

And Feeds Itself Automatically.

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.
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Mining Engineer,

Late Director of the United States Bureau of Statistics Mining Commissioner for the United States Monetary Commission, etc., No. 216 Sansome St., San Francisco. Cable address—"Del Mar, San Francisco." Branch Office, 61 Broadway, New York. Cable address—"Del Mar, New York." London Agency: H. Stoddes & Co., 24 A, Southwark St., S. E. Cable address—"Del Mar, London." Paris Agency: J. H. McDonald & Co., 13 Rue St. Lazare. Cable address—"Del Mar, Paris."

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NOTICE.

The office of the STETEFELDT FURNACE CO., having been removed to New York, parties wishing to obtain information in San Francisco about the Stetefeldt Furnace will apply to Messrs. Prescott, Soett & Co., Union Iron Works, San Francisco. C. A. STETEFELDT.

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Manufacturers of
THE PATENT CHANNEL IRON WHEELBARROWS.

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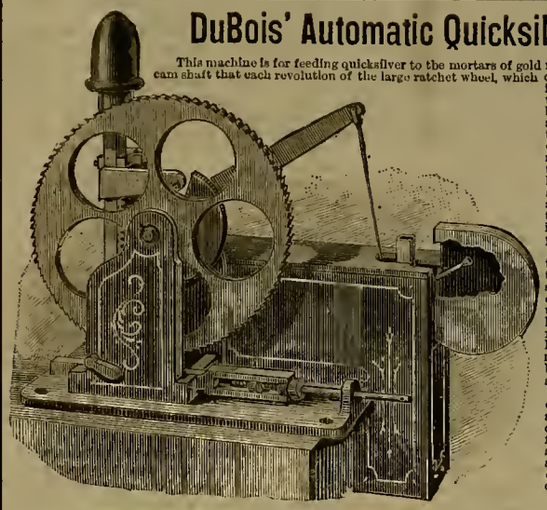
Lap-Welded Pipe, all Sizes, from Three to Six Inches. Artesian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.
Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.

Office and Manufactory, 130 Beale Street, San Francisco.

SHEET IRON PIPE.

DuBois' Automatic Quicksilver Feeder.



This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.
The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.
A chief point of excellence of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; *i. e.*, from every one to four minutes.

Price, complete, $100.

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MANUFACTURERS OF
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HOWLAND'S PULVERIZER Takes the Place of the Cumbersome Stamp Mill and can be put up in one day ready for work.

IT HAS BEEN FULLY PROVED AND TESTED.

It weighs complete, 7,000 pounds It costs $1,500 ready for the belt Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.

Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver ores Chloridizing Furnaces, Retorts, Rock Drills Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies Iron Work complete for Wood Frames, also

SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.

☞ Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.

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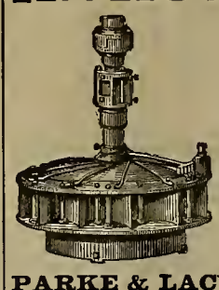

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Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
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Constantly on hand a full assortment of Manila Rope, Sisal Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
Extra sizes and lengths made to order on short notice.

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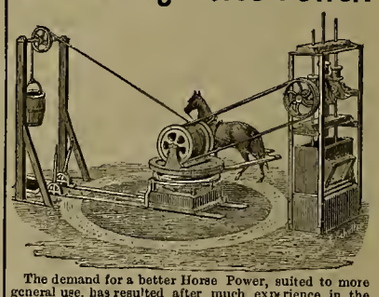
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.

This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.

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And the BEST MACHINERY in the WORLD for BORING and DRILLING WELLS by Horse or Steam Power!
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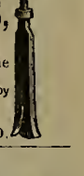

F. VON LEICHT,
Mining and Civil Engineer,
Montgomery Street, San Francisco.
☞ Reports, Surveys and Plans of Mines made. ☜

Notices of Recent Patents.

Among ths patsnts recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

RAILWAY TRACK GAUGE AND LEVEL.—Chas. F. Bergh, Alma, Santa Clara county, assignor of one-half to Lysander Collins, same placs. No. 250,777. Dated Dec. 13, 1881. This track gauge and level consists in a novel arrangemsnt of parts, whereby an instrument is made which will accomplish the object intended with ease and accuracy. The stock has shoulders by which it rests, and fite between the rails. The top of the stock is cut out to form a recess, in which is a har, pivoted at ons end, and carrying an ordinary levsl. Ths free end of ths har is provided with a rack, with which a pinion on the end of a thumb-screw engages, so ths har may bs raised or lowered about its pivoted end. This means of adjusting the bar and spirit level is much hetter than the set-scrsw method. On the sides of ths har are gradnated scales. When the track is straight, the level in the bar will level it. When the track is to be curved, the degree heing first determined upon hy ths direction or curve of the road, the object then to determine is, how much one rail is to bs raised above another. It is a matter of calculation, that when a curve of a certain degres is made, one rail should bs raised above another a certain distance. The scale of dsgrees and scale of inches on the swinging bar are made to correspond, so that when a certain degree appears above the edge of the stock when the har is raised, a certain inch line will also appear, and that line is the exact distance the rail must be raised when a curve of this degrse is to be made on ths track. As hefors said, the graduated scales upon ths end of the bar and the correspondence are derived by calculation, and the object in having both the scales of dsgrees and of inches upon ths bar is, that the trackmen may see about how much to raise the rail without having to consult the tables of calcnlation. Knowing the degres of curvature to he made, they have hut to raiss the swinging bar so that the degres shall appear upon the scale, when the inches, which are made to correspond, will also appear, and they can see at a glance how much to raise a rail. If the roadbed requires a very short cnrve to be made, the rails reqnire to be separated a little more than in the case of a long curvs. A sliding bar e fixed in the gauge to account for this.

EGG AND FRUIT CARRIER.—J. J. McIntyrs, Oakland. Dated Dec. 27, 1881. No. 251,617. This is an improvement in cases designed for transporting eggs, fruit, or othsr similar articles; and it consists in a novel msthod of cutting, uniting and locking the strips which form the compartments that contain and separate the eggs, and that are placed in tiers one above the other in suitable cases, each tier having a loose hottom or diaphragm interposed between it and the next set of compartments. Many forms of compartment cases have heen constructed, most of which have one or both of the sets of transverse atrips notched upon the edges, and as these strips are usually made of pasteboard for economy, these cut edges are easily folded down or destroyed by handling and breaking of eggs. This invention contemplates the use of two sets of strips, those running in one direction having slots extending transversely across the center, but not extending to the edges. The other set of strips are sufficiently wide to just pass through and fill these slots, and they have small central slots just where they meet the other set of strips, through which a narrow atrip of material passes, alternately to one eide and the other of the first-mentioned strips, so as to form a lock.

PORTABLE COVERED HAMMOCK AND FRAME.—N. Vizelich, Stockton. Dated, Dec. 27, 1881. No. 251,488. This invention relates to a portable hammock adapted to receive a cover, and to the frame for awinging said hammock, the object of the invention being to provide a ready, convenient and secure place to lie down, when necessary. The iuvention consists in the arraugement and combination of certain props, supports and braces, which may be easily set up and taken down, and in a hammock adapted to he suspended from the frame thus made, said hammock heing provided with head and foot stretchers and curved bars, upon which is laid and supported a covering, whereby protection is afforded to the occupant, and the whole device heing adapted, when taken down, to he rolled up together, the hammock forming the casing or sack, and etrapped into a small compass, so that it may he transported with ease from place to place, aa necessity requires.

RAILROAD SWITCH.—Marius R. Dahlgren, Oakland. Dated Dec. 27, 1881. No. 251,417. Thie improvement on railroad switches consists in a novel combination of apparatus which is connected with the switch-rail to be moved, and has extensions in each direction, with crank-arms or disks. These arms are so placed that devicea carried upon the locomotive may be thrown out so as to strike either one or the other, and thus throw the awitch-rail in either direction desired, and when approaching the switch from either direction or upon either hand.

GAG RUNNER.—William M. Blaine, Salinas. Dated Dec. 20, 1881, No. 251,021. This invention relates to an improvement in gag runners for bridle, and espscially to ths constrnction of a cantral bridge or support for the loop, and from the under sids of which a spire projects for adjusting the gag rnnner. It consists of an opsn elongated frame, with a central transverse piece or bridge, from which the loop sxtends, being made a part thereof, whereby strength is gained. Two openings are thue formed in the frame or clamp through which the strap passes, and by which it can he slippsd up and down. From the underside of the transvsrss piece or bridge forming the bass of the loop, a spnr projects to fit the holes in ths straps, whereby the gag runner is made adjustahle. The object of ths invsntion is to provide a gag runner, which will combine strength, durahility and simplicity, and at ths same time he adjustable whereby the check can be rsgnlated

ROLLER DEVICE FOR SEAMS OF TIN ROOFS.—Chas. D. Morin, Woodland, Yolo Co., Cal. No. 250,446. Dated Dec. 13, 1881. This is a machine or roller device for rolling and flattening out the seams on tin roofs of honses. It consists of a heavy roller, journaled in a frame having a handle, in combination with a brake for eaid roller, and an upper or supplementary frame, on which additional weight may bs placed whsn necessary. The object of the inventor is to provide a device which will save labor and flatten out the ssams regularly and easily, thus preparing them for the bstter rsception of ths solder. It therefore has application merely to such seams as reqnirs to be flattened and is not for making and rolling upright seams on tin roofs.

FOOTSTOOLS FOR ROCKING CHAIRS.—F. Franz, S. F. Dated Dsc. 20, 1881. No. 251,034. The invention consists in a flat board or foot rest, under which is journaled a roller, and to which is attached a wire or rod, the other end of which ie fitted to and is adapted to move back and forth upon a guide board under the chair. The feet rest upon the board and by the motion of the chair, said board is rolled back and forth.

FURNACE.—Henry R. Taylor, S. F. Dated Dec. 27, 1881. No. 251,485. This invention relates to the class of cupelling and melting assay furnaces. It consists in certain details of construction, whereby the inventor is enabled to make a furnacs that will be strong and firm without the employment of circumscribing sheet-iron cylinder or bands of strap iron.

Pacific Coast Weather for the Week.

[Furnished for publication in the PRESS by NELSON GEROM, Sergt. Signal Service Corps, U. S. A.]

The following is a summary of the rainfall for each day of the week ending Wednesday, Jan. 4th, at noon, for the stations named:

Date.	Olympia.	Portland.	Roseburg	Red Bluff	Sacram'to	San Francisco	Visalia.	Los Angeles.	San Diego.
Thursday, 29th	*.07	.02	.00	.01	.03	.00	.00	.00	.00
Friday, 30th...	.00	.00	.00	.00	.00	.00	.00	.00	.00
Saturday, 31st.	.37	.15	.00	.00	.00	.00	.00	.00	.00
Sunday, 1st...	.33	.80	.75	.00	.00	.00	.00	.00	.00
Monday, 2d...	.44	.48	.38	.23	.08	.06	.—	.00	.00
Tuesday, 3d...	.08	.24	.43	*.09	.05	.07	.00	.00	.00
Wed'sday, 4th.	*.34	*.45	*.11	.73	.37	.19	.—	.00	.00
Total for Week.	*1.63	*2.14	*1.67	1.00	0.53	0.32	0.—	.00	.00

*Sixteen hours missing from Olympia, and 8 hours from Portland, Roseburg and Red Bluff during week. Reports missing from north of Red Bluff this P. M.

A FEARFUL calamity occurred at Shanesville, O., last Satnrday night. It resulted in the loss of several lives, and aeriona injnry to nearly 100 victims. A floor gave way with a terrible crash, precipitating 300 people to the first floor. The red-hot atove fell with the crowd, and the oil from the broken chandeliers aaturated the clothing of the unfortunate victims, and the whole mass was soon enveloped in flames. The hand had just ceased playing, when the orash was heard and the floor began to settle lengthwise in the centar; the joists slipped off the posts in the rear, and pulled out of the brick wall in front. The center settled rapidly and broke lengthwise. This threw people, tahles, stovea and all together. The falling floor barricaded the front doors, but they were soon chopped down.

AT the annual meeting of the Academy of Sciences, B. B. Redding, Prssident of the Board of Trustees, read the report of the Board of Trustees. It atated that the liabilities of the Academy at the beginning of 1881 were $2,956.47, without interest. At the present date the Academy owed nothing and had a cash balance on hand of $91.07. The total receipts of the year were $8,683.67; expenditures, $8,592 60. There is owing from membera $464.50. H. M. Newhall, a fellow member, had generously deducted $1,200 from the rent of the bnilding.

SMALLPOX is on the decrease in Chicago now. The cases have run down from an average of 15 cases per day during the 1st of Decemher to an average of 4 the latter part. There have heen 30,000 free vaocinations during Decemher, and arrangements have been made for 50,000 in January.

News in Brief.

AN agent of an Eastern packing establishment is in Glendive, M. T., buying bnffalo meat to ship East for canning.

THE investigation of the theaters in New York bring to light instances of failure to comply with the requirement of ths laws in nearly svery establishmsnt.

DE LONG'S store, at Fresno, was sntered by burglars on Thursday night. The thieves were snhsequently capturad, and are in jail and the stolen goods recovered.

IT is said that Los Angsles county produces 45% of all the corn raised in Californie. Last year's crop was 752,104 bushels, against 1,993,325 bnshels in ths whole State.

THE arrival of the nsw year and the throwing open of the Whits Houss has broken the season of univereal monrning in Washington society over President Garfield.

THE Southern Pacific Railroad Company, of Arizona, has appropriated $300,000 for the construction of the road from Yuma to Port Isabsl. President Crocker says the road will be completed in 60 days.

THE Sunday law went into forcs in Washington Territory on the 1st inst. In Seattle, the law is strictly obssrved, bnt the prevailing sentiment sesms to be that the law is void and will be disregarded in future.

THE Columbia and Pugst sound, otherwise the Northsrn Pacific Railroad Co., ie endeavoring to get a right of way along the city front of Seattle. The company promises to put in switches and side tracks wherever owners of wharves desire for ths handling of grain.

THE coinage at the United Statss Mints during Dec., 1881, was: Gold, 1,260,476 pieces; value, $10,220,530; silvsr, 2,445,100 pieces; value, $2,418,908; minor, 5,542 925 piecss; value, $58,263.

THE surveyors of the Atlantic & Pacifio railroad located the line of ths road through the town of Baksrefield, a few days ago. Ths fact caused grsat rejoicing in Baksrsfield, and a marked advancs in real estats is expsctsd.

ANOTHER grand cavern has recsntly heen discovered in ths Castle range, M. T. B. M. Bean, shsep hsrder, accidentally came upon its entrance. The main apartmsnt is about 100 yards in length and ths same in width, and the ceiling is from 60 to 100 ft. in hight.

THE great progress of Chicago as a monsy centsr is shown in the incrsass of surplus and undivided earnings and of ths dsposits of Chicago banks and hankers. In '80 the former were $3,413,659; in '81, $5,778 000. Ths deposits in '80 were $59,975,866; in '81 they reached $90,479,708.

THE SACKETT SCHOOL.—This well-known Oakland school for boys began its new year on January 3d, most auspiciously. Ths attendance of scholars has increased 50% since last term, and everything promises a prosperous year for the institution.

A Special Publication.

We call the attention of our readers to a special publication (in this number of the MINING AND SCIENTIFIC PRESS), with accompanying cuts of the Studebaker Manufacturing Co.'a carriage and wagon works, at South Bend, Ind. It will be perused with pleasure and profit, as these gigantio enterprises are the outgrowth of the progress of thia age—a part of our history and the pride of the Americ an psople.

Mining and Scientific Press.

THE MINING AND SCIENTIFIC PRESS is the leading mining journal in America, and enjoys a larger circulation among the more intelligent operators and workers in the gold fields of the world.

Established in 1860, it bas firmly maintained its positon as a reliable, progressive journal. The information given in its columns has saved millions of dollars to the practical miners, metallurgists, mill men, mine and shareholders on the Western side of our continent.

Among its contributors are the ablest and most experienced mining engineers, superintendents and practical miners in this country.

The PRESS gives a condensed summary of Mining News from the most important mining districts of the country.

New processes and methods of mining are described in its weekly issues. New mining machinery and improvements are frequently illustrated and explained in a manner to be of great value to all interested in mining.

As a scientific and mechanical representative of the Pacific coast it is decidedly popular, and a standard journal with the most thrifty industrial people of the Pacific States and Territories. Its authority is of the highest order, and its usefulness in its special sphere unrivalled.

Every public library, mining engineer, metallurgist, mining operator and intelligent mechanic and manufacturer, will find profit by its reading.

Subscription, $4 a year in advance. Sample copies, postpaid, 10 cents.

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San Francisco Metal Market.

[WHOLESALE.
THURSDAY, January 5, 1881.

IRON.—			
American, Pig, soft, ton	—	—	@30 00
Scotch. Pig, ton	25	50	@27 50
American White Pig, ton	—	—	@— —
Oregon Pig, ton	—	—	@29 00
Clipper Gap, No. 1	—	—	@28 00
Clipper Gap, White	—	—	@32 00
Clipper Gap Car Wheel	—	—	@35 00
Refined Bar	4	@	
Horse Shoes, keg	—	@	5 50
Nail Rod	—	@	7½
Norway, according to thickness	6½	@	70
STEEL.—			
English Cast, lb	13	@	15
Black Diamond, ordinary sizes	—	@	15
Drill	15	@	16
Flat Bar	16	@	18
COPPER.—			
Ingot	—	@	22
Sheet	—	@	20
Sheating, Tinned 14x18	—	@	31
Nails	—	@	—
Bolts	—	@	33
Old	—	@	—
Bar	—	@	22
Cement, 100 fine	—	@	15½
LEAD.—			
Pig	—	@	5
Bar	—	@	6
Pipe	—	@	8
Sheet	—	@	8
Shot, discount 10% on 500 Bags			
Drop, per bag	—	@	2 10
Buck, "	—	@	2 30
Chilled "	—	@	2 50
TIN PLATES.—			
10x14 I C Charcoal	—	@	7 50
10x14 I C Coke	6 15	@	6 40
Banca Tin	—	@	22 50
Australian	—	@	23 50
I. C. Charcoal Rooting 14x20	—	@	6 90
ZINC.—			
By the Cask	—	@	9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	—	@	10
NAILS.—			
Assorted Sizes	4 00	@	4 15
QUICKSILVER.—			
By the flask	@37½		41
Flasks, new	—	@	1 25
Flasks, old	—	@	1 05

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, January 4, 3 P. M.

SILVER, 1@1.
GOLD BARS, 890@910. SILVER BARS, 10@18 ₱ cent. discount.
EXCHANGE on New York, ¼ premium; London, 49½@50; Paris, 5.20 francs ₱ dollar; Mexican dollars, 90½@91
NEW YORK (4 per cent), 117½.

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Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company,

SAN FRANCISCO, DECEMBER 31, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, an extra dividend, No. 37, of seventy-five cents (75c.) per share was declared, payable on Thursday, January 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Company, in New York.

WM. WILLIS, Secretary.

Office—Room 20, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

DIVIDEND NOTICE.

San Francisco Savings Union.

532 California St., corner Webb.

For the half year ending with December 31, 1881, a dividend has been declared at the rate of five (5) per cent. per annum on Term Deposits, and four and one-sixth (4 1-6) per cent. per annum on Ordinary Deposits, free of Federal Tax, payable on and after Wednesday, January 11, 1882.

LOVELL WHITE, Cashier.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half-year ending December 31st, 1881, the Board of Directors of THE GERMAN SAVINGS AND LOAN SOCIETY has declared a dividend on Term Deposits at the rate of Five (5) per cent. per annum, and on Ordinary Deposits at the rate of four and one-sixth (4 1-6) per cent. per annum, free from Federal Taxes, and payable on and after the 9th day of January, 1882. By order,

GEO. LETTE, Secretary.

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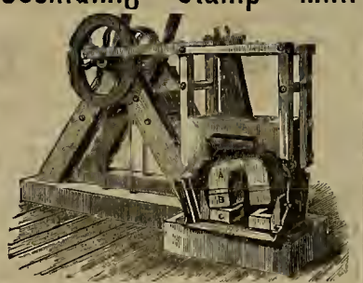

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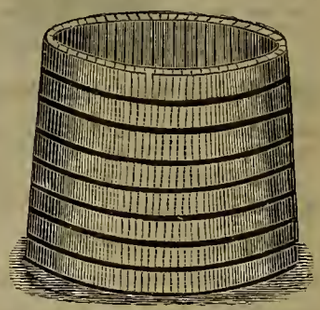

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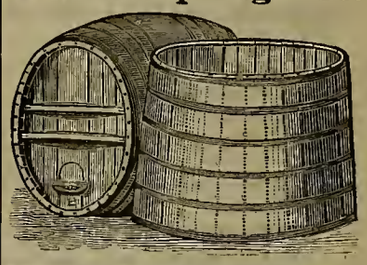

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Dewey & Co. { 252 Market St. } **Patent Agt's**

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of special mention:

Railway Track Gauge and Level.—Chas. F. Bergh, Alma, Santa Clara county, assignor of one-half to Lysander Collins, same place. No. 250,777. Dated Dec. 13, 1881. This track gauge and level consists in a novel arrangement of parts, whereby an instrument is made which will accomplish the object intended with ease and accuracy. The stock has shoulders hy which it rests, and fits between the rails. The top of the stock is cut out to form a recess, in which is a har, pivoted at one end, and carrying an ordinary level. The free end of the har is provided with a rack, with which a pinion on the end of a thumh-screw engages, so the har may be raised or lowered ahout its pivoted end. This means of adjusting the har and spirit level is much better than the set-screw method. On the sides of the har are graduated scales. When the track is straight, the level in the har will level it. When the track is to he curved, the degree heing first determined upon hy the direction or curve of the road, the object then to determine is, how much one rail is to be raised above another. It is a matter of calculation, that when a curve of a certain degree is made, one rail should be raised above another a certain distance. The scale of degrees and scale of inches on the swinging har are made to correspond, so that when a certain degree appears above the edge of the stock when the bar is raised, a certain inch line will also appear, and that line is the exact distance the rail must be raised when a curve of this degree is to he made on the track. As hefore said, the graduated scales upon the end of the har and the correspondence are derived hy calculation, and the object in having hoth the scales of degrees and of inches upon the har is, that the trackmen may see ahout how much to raise the rail without having to consult the tahles of calculation. Knowing the degree of curvature to he made, they have hut to raise the swinging har so that the degree shall appear upon the scale, when the inches, which are made to correspond, will also appear, and they can see at a glance how much to raise a rail. If the road-hed requires a very short curve to he made, the rails require to he separated a little more than in the case of a long curve. A sliding har s fixed in the gauge to account for this.

Egg and Fruit Carrier.—J. J. McIntyre, Oakland. Dated Dec. 27, 1881. No. 251,617. This is an improvement in cases designed for transporting eggs, fruit, or other similar articles; and it consists in a novel method of cutting, uniting and locking the strips which form the compartments that contain and separate the eggs, and that are placed in tiers one ahove the other in suitable cases, each tier having a loose hottom or diaphragm interposed between it and the next set of compartments. Many forms of compartment casee have been constructed, most of which have one or hoth of the sets of transverse strips notched upon the edges, and as these strips are usually made of pastehoard for economy, theee cut edges are easily folded down or destroyed hy handling and breaking of eggs. This invention contemplates the use of two sets of strips, those running in one direction having slots extending transversely across the center, hut not extending to the edges. The other set of etrips are sufficiently wide to just pass throngh and fill these slots, and they have small central slots just where they meet the other eet of etrips, through which a narrow strip of material passes, alternately to one side and the other of the first-mentioned strips, so as to form a lock.

Portable Covered Hammock and Frame.—N. Vizelich, Stockton. Dated, Dec. 27, 1881. No. 251,488. This invention relates to a portable hammock adapted to receive a cover, and to the frame for swinging said hammock, the ohject of the invention heing to provide a ready, convenient and secure place to lie down, when necessary. The invention consists in the arrangement and comhination of certain props, supports and hraces, which may he easily eet up and taken down, and in a hammock adapted to he suspended from the frame thus made, said hammock heing provided with head and foot etretchers and curved hars, upon which is laid and supported a covering, whereby protection is afforded to the occupant, and the whole device heing adapted, when taken down, to he rolled up together, the hammock forming the casing or sack, and strapped into s small compass, so that it may he transported with ease from place to place, as necessity requires.

Railroad Switch.—Marius R. Dahlgren, Oakland. Dated Dec. 27, 1881. No. 251,417. This improvement on railroad switches consists in a novel comhination of apparatus which is connected with the switch-rail to he moved, and has extensions in each direction, with crank-arme or disks. These arms are so placed that devices carried npon the locomotive may he thrown out so as to etrike either one or the other, and thus throw the switch-rail in either direction desired, and when approaching the switch from either direction or upon either hand.

Gag Runner.—William M. Blaine, Salinas. Dated Dec. 20, 1881, No. 251,021. This invention relates to an improvement in gag rnnners for bridle, and especially to the construction of a central hridge or support for the loop, and from the nnder side of which a spire projects for adjusting the gag rnnner. It consists of an open elongated frame, with a central transverse piece or bridge, from which the loop extends, heing made a part thereof, wherehy strength is gained. Two openings are thus formed in the frame or clamp throngh which the strap passes, and by which it can he slipped up and down. From the underside of the transverse piece or hridge forming the base of the loop, a spur projects to fit the holes in the straps, wherehy the gag runner is made adjnstahle. The object of the invention is to provide a gag runner, which will comhine strength, durahility and simplicity, and at the same time he adjnstahle wherehy the check can he regulated

Roller Device for Seams of Tin Roofs.—Chas. D. Morin, Woodland, Yolo Co., Cal. No. 250,446. Dated Dec. 13, 1881. This is a machine or roller device for rolling and flattening ont the seams on tin roofs of honses. It consists of a heavy roller, jonrnaled in a frame having a handle, in comhination with a brake for said roller, and an npper or supplementary frame, on which additional weight may he placed when necessary. The object of the inventor is to provide a device which will save labor and flatten out the seams regularly and easily, thns preparing them for the hetter reception of the solder. It therefore has application merely to such seams as reqnire to he flattened and is not for making and rolling upright seams on tin roofs.

Footstools for Rocking Chairs.—F. Franz, S. F. Dated Dec. 20, 1881. No. 251,034. The invention consists in a flat hoard or foot rest, under which is journaled a roller, and to which is attached a wire or rod, the other end of which is fitted to and is adapted to move back and forth upon a gnide board under the chair. The feet rest upon the hoard and hy the motion of the chair, said hoard is rolled hack and forth.

Furnace.—Henry R. Taylor, S. F. Dated Dec. 27, 1881. No. 251,485. This invention relates to the class of cupelling and melting assay furnaces. It consists in certain details of constrnction, whereby the inventor is enahled to make a furnace that will he strong and firm without the employment of circnmscribing sheet-iron cylinder or hands of strap iron.

Pacific Coast Weather for the Week.

[Furnished for publication in the Press by Nelson Gerom, Sergt. Signal Service Corps, U. S. A.]

The following is a summary of the rainfall for each day of the week ending Wednesday, Jan. 4th, at noon, for the stations named:

Date.	Olympia.	Portland.	Roseburg	Red Bluff	Sacramento	San Francisco	Visalia.	Los Angeles.	San Diego
Thursday, 29th	*.07	.02	.00	.01	.03	.00	.00	.00	00
Friday, 30th...	.00	.00	.00	.00	.00	.00	.00	.00	00
Saturday, 31st.	.37	.15	.00	.00	.00	.00	.00	.00	00
Sunday, 1st..	.33	.80	.75	.00	.09	.00	.00	.00	00
Monday, 2d...	.44	.48	.38	.23	.08	.06	—	.00	00
Tuesday, 3d..	.08	.24	.43	*.09	.05	.07	.00	.00	00
Wed'sday, 4th.	*.34	*.45	*.11	.73	.37	.19	—	.00	00
Total for Week.	*1.63	*2.14	*1.67	1.06	0.53	0.32	0.-	.00	00

*Sixteen hours missing from Olympia, and 8 hours from Portland, Roseburg and Red Bluff during week. Reports missing from north of Red Bluff this P. M.

A fearful calamity occnrred at Shanesville, O., last Saturday night. It resnlted in the loss of several lives, and serious injury to nearly 100 victims. A floor gave way witb a terrible crash, precipitating 300 people to the first floor. The red-hot stove fell with the crowd, and the oil from the broken chandeliere eaturated the clothing of the unfortunate victims, and the whole mase was soon enveloped in flames. The hand had just ceaeed playing, when the crash was heard and the floor hegan to settle lengthwise in the center; the joists slipped off the posts in the rear, and pulled ont of the brick wall in front. The center settled rapidly and broke lengthwise. Thie threw people, tables, etoves and all together. The falling floor barricaded the front doore, hut they were soon chopped down.

At the annual meeting of the Academy of Sciences, B. B. Redding, President of the Board of Trustees, read the report of the Board of Trustees. It stated that the liabilities of the Academy at the heginning of 1881 were $2,956.47, without interest. At the present date the Academy owed nothing and had a cash balance on hand of $91.07. The total receipts of the year were $8,683.67; expenditures, $8,592 60. There is owing from members $464.50. H. M. Newhall, a fellow member, had generously deducted $1,200 from the rent of the hnilding.

Smallpox is on the decrease in Chicago now. The cases have rnn down from an average of 15 cases per day during the 1st of December to an average of 4 the latter part. There have heen 30,000 free vaccinations during December, and arrangements have been made for 50,000 in January.

News in Brief.

An agent of sn Eastern packing establishment is in Glendive, M. T., bnying bnffalo meat to ship East for canning.

The investigation of the theaters in New York bring to light instances of failure to comply with the requirement of the laws in nearly every establishment.

De Long's store, at Fresno, was entered hy burglars on Thursday night. The thieves were snbsequently captured, and are in jail and the stolen goods recovered.

It is said that Los Angeles county prodnces 45% of all the corn raised in California. Last year's crop was 752,104 bushels, against 1,993,325 bnshels in the whole State.

The arrival of the new year and the throwing open of the White House has broken the season of universal monrning in Washington society over President Garfield.

The Southern Pacific Railroad Company, of Arizona, has appropriated $300,000 for the construction of the road from Ynma to Port Isahel. President Crocker says the road will he completed in 60 days.

The Sunday law went into force in Washington Territory on the 1st inst. In Seattle, the law is strictly ohserved, bnt tbe prevailing sentiment seems to he that the law is void and will he disregarded in future.

The Columhia and Puget sonnd, otherwise the Northern Pacific Railroad Co., is endeavoring to get a right of way along the city front of Seattle. The company promises to put in switches and side tracks wherever owners of wharves desire for the handling of grain.

The coinage at the United States Mints dnring Dec., 1881, was: Gold, 1,260,476 pieces; valne, $10,220,530; silver, 2,445,100 pieces; valne, $2,418,908; minor, 5,542,925 pieces; value, $58,263.

The snrveyors of the Atlantic & Pacific railroad located the line of the road through the town of Bakersfield, a few days ago. The fact caused great rejoicing in Bakersfield, and a marked advance in real estate is expected.

Another grand cavern has recently heen discovered in the Castle range, M. T. B. M. Bean, sheep herder, accidentally came upon its entrance. The main apartment is ahout 100 yards in length and the same in width, and the ceiling is from 60 to 100 ft. in hight.

The great progress of Chicago as a money oenter is shown in the increase of snrplus and nndivided earnings and of the deposits of Chicago hanks and hankers. In '80 the former were $3,413,659; in '81, $5,778 000. The deposits in '80 were $59,975,866; in '81 they reached $90,479,708.

The Sackett School.—This well-known Oakland school for hoys began its new year on January 3d, most auspicionely. The attendance of scholars has increased 50% since last term, and everything promises a prosperons year for the institution.

A Special Publication.

We call the attention of onr readere to a special publication (in this nnmber of tbe Mining and Scientific Press), with accompanying cuts of the Studehaker Mannfactnring Co.'e carriage and wagon works, at Sonth Bend, Ind. It will be pernsed with pleasnre and profit, as theee gigantio enterprises are the outgrowth of the progress of tbis age—a part of our history and the pride of the Americ an people.

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The Mining and Scientific Press is the leading mining journal in America, and enjoys a larger circulation among the more intelligent operators and workers in the gold fields of the world.

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M. P. Owen—Santa Cruz county.
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Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

Persons receiving a sample copy of the Mining and Scientific Press *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

Important additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

The State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

By Telephone.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central systemin San Francisco.

Correspondence on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

Copp's "U. S. Mineral Lands, Laws, Forms, Instructions and Decisions."—1881. 570 pp. In full law binding, $4.50; half law binding, $3, at this office.

Annual Statistician of 1881.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 816 California st. Price, $4

San Francisco Metal Market.

[Wholesale.
Thursday, January 5, 1881.

Iron.—	
American, Pig, soft, ton	— — @30 00
Scotch, Pig, ton	25 50 @27 50
American White Pig, ton	— — @— —
Oregon Pig, ton	— — @29 00
Clipper Gap, No. 1	— — @28 00
Clipper Gap, White	— — @32 00
Clipper Gap Car Wheel	— — @35 00
Refined Bar	4 @
Horse Shoes, keg	— @ 5 50
Nail Rod	— @ 7½
Norway, according to thickness	6½@ 70
Steel.—	
English Cast, lb	13 @ 15
Black Diamond, ordinary sizes	— @ 15
Drill	15 @ 16
Flat Bar	16 @ 18
Copper.—	
Ingot	— @ 22
Sheet	— @ 20
Sheating, Tinned 14x18	— @ 31
Nails	— @ —
Bolts	— @ 33
Old	— @ —
Bar	— @ 22
Cement, 100 fine	— @ 15½
Lead.—	
Pig	— @ 5
Bar	— @ 6
Pipe	— @ 8
Sheet	— @ 8
Shot, discount 10% on 500 Bage	
Drop, per bag	— @ 2 10
Buck, "	— @ 2 30
Chilled "	— @ 2 50
Tin Plates.—	
10x14 I C Charcoal	— @ 7 50
10x14 I C Coke	6 15 @ 6 40
Banca Tin	— @22 50
Australian	— @23 50
I. C. Charcoal Rooting 14x20	— @ 6 90
Zinc.—	
By the Cask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @ 10
Nails.—	
Assorted Sizes	4 00 @ 4 15
Quicksilver.—	
By the flask	@37½ 41
Flasks, new	— — @ 1 25
Flasks, old	— — @ 1 05

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, January 4, 3 P. M.

SILVER, 1@1.

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NEW YORK (4 per cent), 117½.

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Persons interested in incorporatione will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company,

SAN FRANCISCO, DECEMBER 31, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, an extra dividend, No. 37, of seventy-five cents (75c.) per share was declared, payable on Thursday, January 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Company, in New York.

WM. WILLIS, Secretary.

Office—Room 20, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

DIVIDEND NOTICE.

San Francisco Savings Union.

532 California St., corner Webb.

For the half year ending with December 31, 1881, a dividend has been declared at the rate of five (5) per cent. per annum on Term Deposits, and four and one-sixth (4 1-6) per cent. per annum on Ordinary Deposits, free of Federal Tax, payable on and after Wednesday, January 11, 1882.

LOVELL WHITE, Cashier.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half-year ending December 31st, 1881, the Board of Directors of THE GERMAN SAVINGS AND LOAN SOCIETY has declared a dividend on Term Deposits at the rate of Five (5) per cent. per annum, and on Ordinary Deposits at the rate of four and one-sixth (4 1-6) per cent. per annum, free from Federal Taxes, and payable on and after the 9th day of January, 1882. By order,

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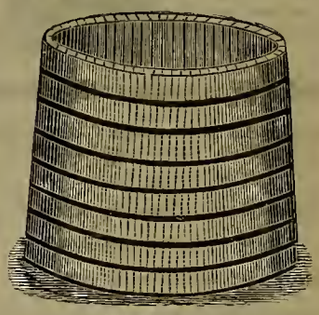

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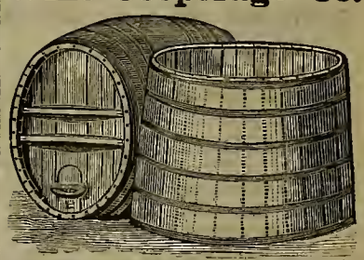

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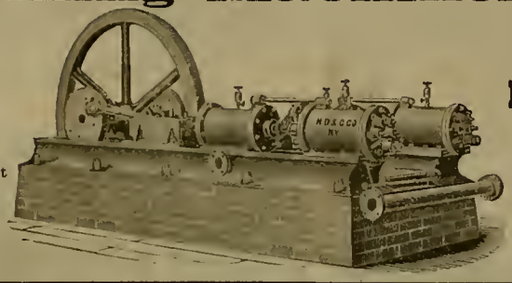

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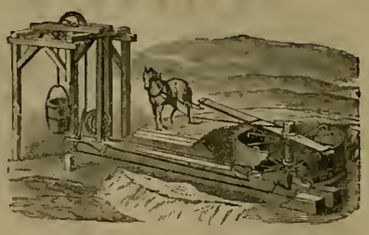

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For working gold and silver ores by wet or dry crushing. The Stetefeldt, Howell's Improved White, Brunton's & Bruckner Furnaces, for working base ores. Rotary Dryers, Stetefeldt Improved Dry Kiln Furnaces.

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If you have not, give it a trial and you will be satisfied that it will do more work for less money than any Powder in the market, and refer to numerous testimonials in support thereof to be found at our office.

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HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

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No. 1 XX) is the Strongest Explosive Known.

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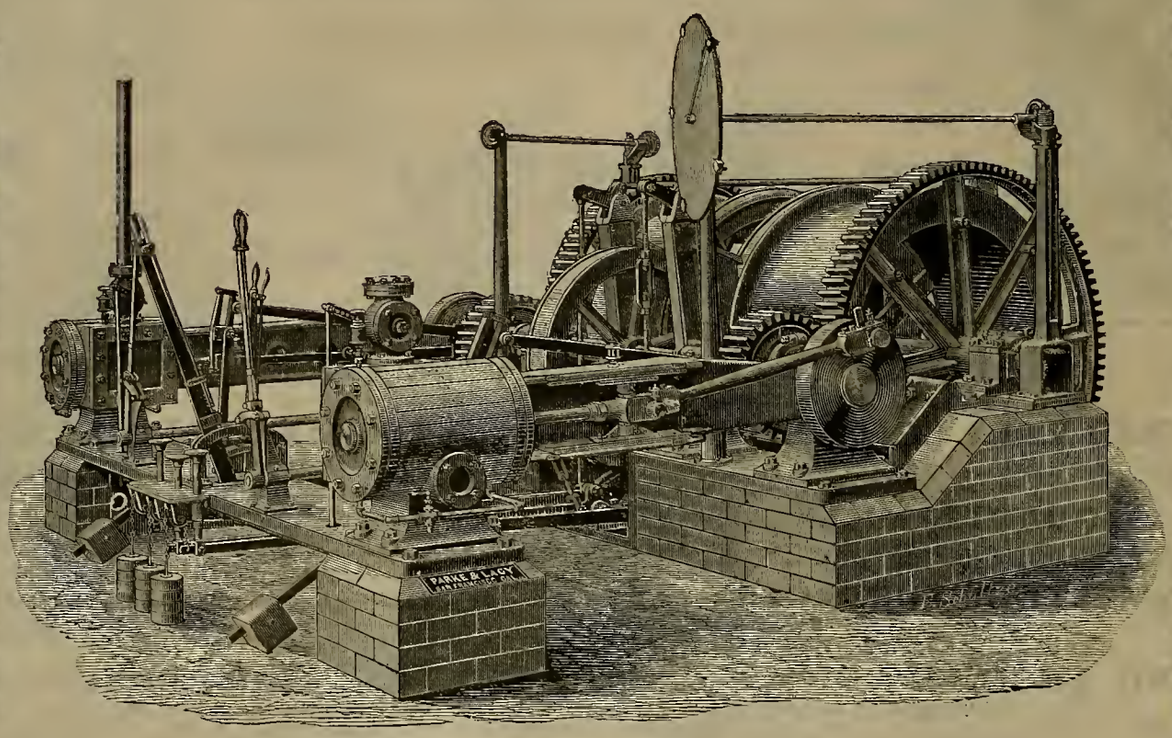
PARKE & LACY, 21 and 23 Fremont Street, San Francisco, Cal.

Rock Drills, Air Compressors—Burleigh's
Machinist's Tools—Putnam's.
Vertical Isochronal Mining Pump—Cope & Maxwell.
Plunger Pumps—Cope & Maxwell.
Direct Acting Steam Pumps—Knowles.

Centrifugal Pumps—Heald & Sisco's.
Vertical Engines—Haskins.
Bucket Plungers, Pumps—Valley M. Co.
Portable Hoisting Engines—Kendall & Roberts'.
Improved Blowers—Baker & Root's.



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Inspirators—Hancock's.
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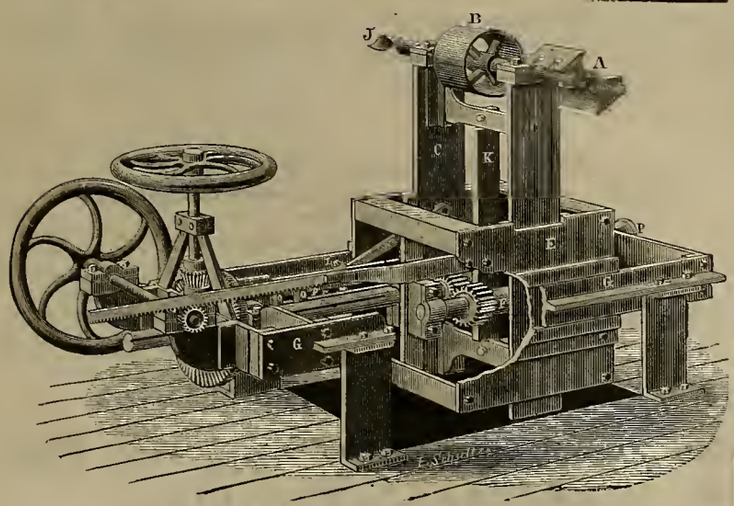
LEPLEY'S FRAMING MACHINE.



The above cut represents the Framing Machine invented by ISAAC LEPLEY, of Amador City, Cal. For perfection and rapidity of work it has no equal. Any form of cut, tenon, mortise, gain or lovetail in timber of any size can be made with exactness, and as rapidly as desired. It is complete in itself in all its parts, ready for the belt. The machine is simple in construction, and can be run by anyone of ordinary ability. Every mine requiring timber, and all mills where much framing is to be done, should have one, as a matter of economy. It will do the work of twenty men.

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SOLE MANUFACTURERS FOR THE PACIFIC COAST.

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1851. 1881.
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Surveys for Location or Patent. Maps and Plans Drawn. Mining Properties of all kinds examined and careful reports made of the same. Consultations on Mining Investments. Address, THOS. W. REECE, CIVIL ENGINEER, Oroville, Butte Co., Cal. References given and required.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JANUARY 14, 1882.

VOLUME XLIV. Number 2.

New Amalgamating Pan.

Frank A. Huntington, of this city, has this week received through the MINING AND SCIENTIFIC PRESS Patent Agency a patent for an improved grinding and amalgamating pan, which possesses some special features worthy the attention of mining men. The pan has nearly or quite vertical sides, upon which are supported dies, either in sections, or in the form of a complete ring, so as to receive the action of one or more shoes, which are fitted to an arm journaled upon a vertical support. When these are driven by the action of a revolving muller, the shoes are thrown outwardly against the dies, both by centrifugal action and by the resistance of the contents of the pan, to wings which project inwardly from the shoe supports.

The pan is of any suitable size and the ring die is dropped or fitted into it in a single piece or made in sections to fit around the inner periphery. From the muller, arms project toward the circumference of the pan, and have sleeves or sockets which carry vertical spindles. These spindles serve to support plates which carry the shoes.

These plates are bent, so that the shoes, when secured to them, will stand so as to present their faces fairly to the dies around the pan. These plates are carried toward the center nearly or quite radially from the spindles upon which they turn, and have broad vanes or ways upon their inner ends.

It will thus be seen, that when the pan is filled with pulp or material, and the muller is revolved the shoes will be thrown outwardly against the dies, partly by centrifugal action; but as the speed is not great enough to render this very effective, the effective work is mostly produced by the pressure of the pulp against the inner ends of the plates or vanes, which then act as levers and their power is increased proportionately with the speed of the muller. The angle of these vanes is such that they also serve to throw pulp outwardly, so as to pass between the shoes and dies.

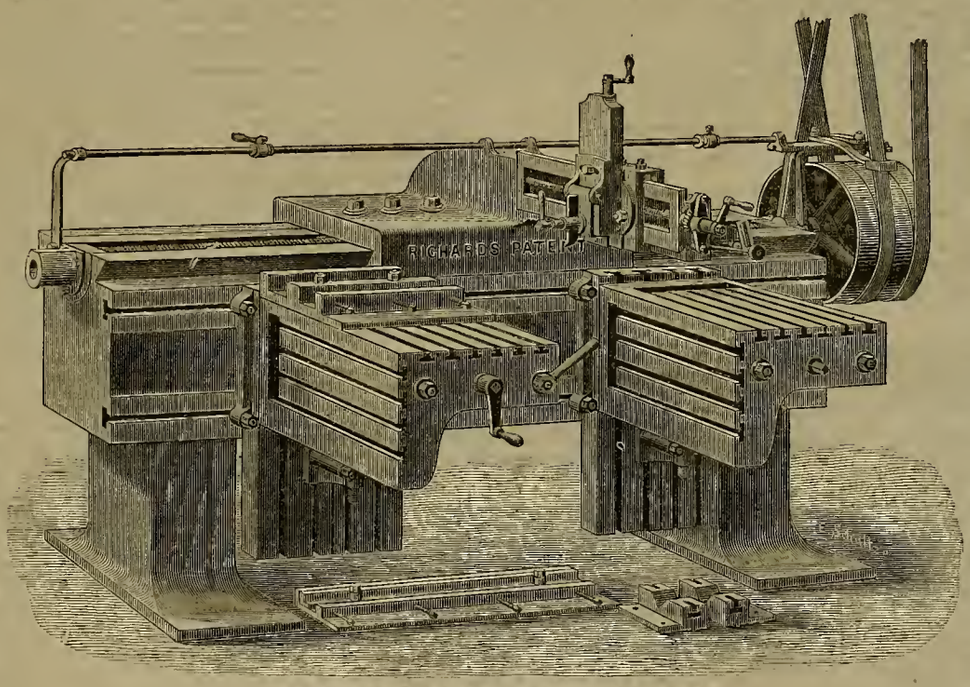
Above the shoes and wings is a horizontal disk which extends from about the edge of the wings nearly to the outside of the pan, thus leaving openings at the center and also around its periphery. Above this disk radial vanes project upward and these serve to guide the material and cause it to flow to the center above the disk. The course of the current will be decided by the disk and vanes, and it will pass below the disk and by centrifugal action to the periphery of the pan; thence upward along the dies, where it will be exposed to the action of the shoes and will then escape through the openings around the periphery of the disk, the vanes preventing a circular motion being imparted to it by the muller.

Mr. Huntington prefers to construct the dies and shoes partly of iron and partly of wood to provide a better surface for grinding. This may be done in various ways. One way is to perforate the shoes and dies, and into the holes short blocks of wood are driven so that the end of the grain of the wood is presented as a surface, which is about or quite level or flush with that of the iron.

In order to carry back any one or more of the shoes from the dies and prevent them from grinding, an executive arm or button is employed, fixed to a stem rising to a convenient hight for operation. By turning the stem, the button will be caused to press against the inner end of the plate or shoe, and will thus force the shoe away from the die and prevent further grinding. This is done after the grinding is complete and while amalgamation is going on, and prevents flowing of the mercury by continued grinding. Or, by reversing the motion of the muller, all the shoes are drawn back from the dies. Any plate, with its shoe, may be lifted off its plate without trouble, when necessary.

A California Planing Machine.

The engraving on this page shows a new type of planing machine, recently brought out at the San Francisco Tool company's works, in this city, the invention of Mr. J. Richards, the Superintendent. The machine is novel, and, we might say, remarkable, in many respects, especially in the great range of work that may be done on it. The tables, in front, can be removed, if necessary, so even the largest pieces can be planed. The stroke is 50 inches, and the traverse, 20 inches, so the area worked over is equal to 1,000 inches, or 7 square ft.



THE RICHARDS PATENT PLANING MACHINE.

This area stroke, and so on, gives a capacity nearly three times as great as can be attained by a shaping machine, of the old style, costing the same amount. No gear wheels are employed, so the machine is noiseless.

The company some time ago furnished Messrs. Savage & Sons, of Fremont street, a machine of this kind, that has been mainly employed since on large pieces. Among other things, most of the planing was done for a new lathe, to turn 6 ft. diameter, constructed by Messrs. Savage & Sons.

We take some pleasure in noticing this machine, as one doing great credit to our city, and the new industry under Mr. Richard's charge. We are informed that the company are now extending their facilities, and that no orders can be filled for some time to come.

Among the new tools making for use in the works, is a planing machine on the same plan, or nearly the same plan, as the one above, to plane 20 ft. long; also, a wheel-cutting machine for wheels to 6 ft. diameter, and a special lathe to turn 6 ft. diameter.

TELEPHONIC conversation, easily and distinctly understood, was held the other day between San Diego and Los Angeles, a distance of 145 miles of wire.

Foundry Notes.

The Pacific Iron Works report much increased activity in the demand for machinery. For a number of months the works have been running a full force, turning out a large amount of mining machinery for various localities. Among the late orders may be mentioned four sets of hoisting works for Idaho and Montana. One of these, including cages, cars, etc., is for the famous Mountain Con. Mining Co., at Butte City. It is intended to work a double compartment shaft to the depth of 1,200 ft., and is one of the best designed and most complete hoists ever constructed.

The firm has recently shipped a 20-stamp mill to Colorado, which they are erecting on the Kansas mine, near Fairplay, at an elevation of 11,000 ft. This is a new departure, and would indicate a preference for California-made machinery not heretofore shown. These works have long been regarded as headquarters for smelting machinery, and their copper and galena smelters are in great use in all parts of the country.

They have now under contract a 30-ton copper-smelting plant for the Santa Catarina Co., and one of the same capacity for the Globe Copper Co.; also a 40 ton galena-silver plant for the Pinal Co. All of these companies are operating in Arizona. The improvements recently patented through this office, add greatly to the durability and economical working of these furnaces.

A 100 H. P. Wheelock engine and boilers is also under contract for the Hollister Flouring Mills. This engine seems to be steadily gaining in favor among engineers and steam users.

POWDER EXPLOSION.—On Wednesday, an explosion of Hercules powder took place near Pinole station, Contra Costa county. It is stated that the steam chest of the engine burst and exploded 1,500 lbs. of nitro glycerine and 300 cartridges. One Chinaman was killed and several of the other employees were injured, but none seriously. The damage was only about $5,000, and the works will be running again in two weeks.

Not California Practices.

Every time there is a swindle or a failure or crookedness of any kind about a mine or mining company in which Eastern people are interested, the Eastern papers take it up and make a howl about the people "introducing the tactics into the management that paralyzed mining on the Pacific coast." All this is laid to California tactics, California practices and California customs.

This is all very well to talk about, but there is a good deal of bosh about it. There are mining frauds in the East as well as here, and in proportion to the population there are very many more of them there, for there are more rich speculators. People who buy mining stocks, if they can sell them for more than they give, are satisfied that they are shrewd business men; if they lose by the stock going down, out here they have learned not to say much about it. East they raise a great howl that they have been swindled, and then lay it to California practices.

It will probably be found that the managers and insiders never lose any money in these swindles; but that cannot be called a California invention, for this sort of result in not confined by any means to mining companies. It will also be found that glowing prospectuses have been published in the papers; and long and flattering accounts of the mine and its prospects for a dividend have also been given, with now and then notes saying the stock was bound to go up, etc. *This* is not a California method. They do not publish prospectuses here at all, not even cards saying where the offices are. Nor are those apparently respectable papers to be found here which make a practice of puffing mines for a consideration as there are in the East. That is purely an Eastern idea.

In every little mining camp out in the west there is a little mining paper, but they do not have their columns ready to sell to the highest bidder, to puff any kind of scheme that comes along. They would be killed in a month or two. It was reserved for large cities in the East to maintain half a dozen or so mining papers in a region a thousand miles or two from any mine. No Californian could do that. We acknowledge it beatsus, for it looks pretty hard to do it on any legitimate basis. A few respectable papers could live properly, but many of the publications must depend on revenues no decent journal would accept.

In fine, the reasons why frauds and swindles are carried out, cannot be laid to the door of California practices. No doubt Eastern speculators have picked up some of the bad practices in vogue here; but there is no reason for the press to lay the bad practices to our doors and take the credit for all the good ones to themselves.

When a mine is being examined, the good opinion of a "practical California miner of long experience" is much sought for, and this is heralded abroad, when favorable. Then the California experience is thought something of. After a while, when the Eastern people get hold of the mine and some rascality comes to light, it is very easy to lay it onto the shoulders of the "California practices." But if the enterprise is at all successful, all the credit is given to "the enterprising Eastern promoters, whose shrewd judgment led them to take the mine in hand."

ABOUT 18,000,000 ft. of lumber was cut in 1881 by the mills lying between Sacramento and the Summit on the Central Pacific Railroad.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Treatment of Sulphurets.

EDITORS PRESS:—It is difficult to do justice to such an article as that on the above snbject in the PRESS of Dec. 31, 1881, from the London *Mining Journal*, and almost as difficult to pass it hy without notice.

The first impression produced by reading the article is, that the number of the London *Mining Journal* from which it is taken must have heen of rather ancient date, but a closer examination reveals the existence of internal evidence incompstible with such a supposition. The nomenclature and notation are evidently intended for those of modern chemistry, while the "chemical law" which forms the fundamental postulate of the argument, the law that simples combine only with simples, and compounds only with compounds, is totally at variance with the views now entertained by chemists, and has long since been abandoned as incorrect. In proof of this it is only necessary to refer to the compounds of cyanogen and of ammoninm, though many other instances might he cited, hut the question though interesting and important to chemical philosophy, is of no practical consequence in the consideration of the treatment of sulphurets.

The next point which attracts attention is the statement that "it is popularly helieved that gold exists in the metallic state only." Now, in this country, at least,

The Popular Belief

Is that the invisible gold existing in sulphurets is chemically combined with them, and only scientific people assert, with considerahle show of reason, that it is not so. Much of this gold, though not visible to the naked eye, is revealed by the microscope as minute grains, or films of extreme tenuity, in the metallic state. Native aurous or auric sulphide is not known, and that it does not exist in pyrites has heen pretty well proved hy the fact that none can he dissolved out of them by the proper solvents for gold snlphides. Gold *may* exist in combination with both sulphur and iron, but the question as to whether such a compound does exist in auriferons pyrites, is one which neither the writer of that article nor the writer of this can with confidence answer affirmatively on the hasis of known facts. But even this is of slight importance from a practical point of view. Quicksilver is indifferent to logic, and if the gold is not in a suitable condition, will have nothing to do with it, metallic or not.

Our writer next presents to the eye of the "scientific imagination," an interesting picture of the "contest" for the possession of the sulphur, which ensnes, when quicksilve is brought into contact with

"Auropyrites;"

A sort of free fight, in which the poor quicksilver is worsted, "sickening, flonring and frothing," (at the mouth?), which wonld he all very well if it were true; hut, nnfortunately for the picture, it is not necessarily so. Then, "evsry miner knows that roasting does not free the gold in the pyrites," we are told, and "in the bsst cases enough sulphur remains with the iron and the gold to prevent amalgamation with mercury." The trnth is that many miners know that a proper roasting does free a very large proportion of the gold, and the Australians have shown that it can in many cases be amalgamated to over 90%; the present writer has reached 80%. The principal difficulty lies, not in the retention of a small proportion of sulphur by the rossted mass, but apparently in the fact that the particles of gold are coated hy iron oxide, while the presence of lead is a more serious obstacle still. But the roasting often occupies 24, or even 30 hours, instead of "at most 18 hours;" this, however, depends upon the size of the particles, and the thickness of the bed of ore operated on, a few minutes suffic. ing, if the particles are small and the exposnre thorough. If amalgamation does not anewer with the roasted material, the chlorination process is frequently adopted with excellent results, though that process is quite ignored in the article referred to.

Saving the Pyrites.

Passing over a rather lame description of the method of concentration of the precioue metal in a matte or regulus by emelting, a method which is not by any meane universally applicahle, we come to remarks which would lead ns to suppose that the English are far behind the Americans in the art of "securing the pyrites in a fairly clean condition." Here we do not "catch the gold in mercury troughs" to any great extent, and we catch the pyrites by means of machines, which, while warranted to save 90% of them, might also be guaranteed to secure them in an almost perfectly olean condition so far as gangue is concerned at least, nor do the "two concentrating operations where one would euffice" involve the slightest inconvenience, nor appreciable increase of expense, because they both go on at the same time, without any handling of the material, while the saving of the free gold by amalgamation, in the battery and on the plates, ie very advautageoue as an immediate source of revenue, besides securing so much from the risks and losses incident to the subseqnent treatment of the ooncentrates by roasting or smelting, etc. Also, it is probable that a portion of the "float gold" which would escape the action of any concentrator, is saved hy the amalgamation.

Mr. Readwin's system of

Dry Grinding

In pans with mercnry will certainly not answer, even with medicated mercury. We have tried dry amalgamation, though we did not generally grind the quicksilver with the ore; the separation was troublesome enough without that. In Anstralia, they grind the quicksilver with moistened roasted pyrites; and although their results seem to be very good, yet they lose a good deal of quicksilver, snd, doubtless, some gold with it.

The French chemist spoken of, proposes to nse, not "calomel," which is insoluble and very difficult of reduction to metal, but corrosive sublimate, in presence of metallic iron. The method is hased on the well-known fact, thst when gold is touched by iron, in presence of even a very weak solution of corrosive sublimate, the gold is instantly amalgamated with mercury precipitated upon it hy galvanic action. The objections which present themselves are, that the iron will speedily decompose the corrosive snblimate without the contact of gold, and that it will not decompose the calomel, which is likely to he formed by the contact of the portion of mercury first reduced with the yet undecomposed portion of corrosive suhlimate. The production of calomel wonld not only cause the loss of the mercury so converted, hut would also tend to the sickening of that which might remain metallic.

Finally, the only distinction necessary to he made hetween mines of free gold in quartz, and mines carrying also anriferons sulphnrets is, that the latter mnst be furnished with concentrating machines in addition to the usual appliances for battery amalgamation, and a market or means must he found for the disposal of the concentrates. Where the latter are treated by chlorination, it wonld, in many cases, not answer to omit the amalgamation before concentration, because some of the particles of free gold may be too large to be completely dissolved hy chlorine, nnless the screens are of inconvenient fineness, cansing greater loss in the concentration, and reducing the working capacity of the mill.

C. H. AARON.

Note.—The error of describing the snlphides of mercury as oxides, in the article from the *Mining Journal*, is probably a slip of the pen, which, however, should not have hsen permitted to occur in an article of that character.

Gillis Mountain.

A correspondent of the Candelaria *True Fissure:* After a long silence I will endeavor to enlighten themsny readers of your pspei as to what is going on in this quiet community. The mines have never looked hetter than they do at present. The Burnley is taking out plenty of $4,000 ore from a point 150 ft. helow the surface. All the hoisting has been done by man power, hut the management proposes to put a whim on the mine, and the same was delivered on the dump to-day by John R. Benton. That gentleman is now on his return trip to Luning with a load of ore from the ahove mine. There are several loads sacked which Mr. Bsnton has engaged to hanl to the railroad. From all appearances, the mine is improving as depth is attained. When the whim is in position and sinking commences in earnest, some big strikes may be looked for. J. R. Benton and C. E. Kennedy had some very fine prospects in the district, with water rights which, if they were in the hands of some one of small capital to assist in developing them, could he made paying properties. I think the station, Luning, has a bright future awaiting it. There are four mining districts which wil lmake this their shipping and receiving point. These will be Garfield district on the west, Silver Stsr on the south, Santa Fe on the east, and last, but not lesst, Gillis Mountain on the north. These, together with a vast country to the east, inclnding Grantsville, Downeyville, Lodi, Ellsworth, Ione and Belmont, will all come to this railroad station for their freight. There is a tri-weekly stage running from Luning to Grantsville, connecting with the eastern lines. It is owned and operated hy the well-known firm of Gilmer, Salishury & Co., and from present appearances there will he a lively passenger travel this way. The coach comeeinloaded down. I saw six passengers get off yesterday and all hound for your town, which seeme to he the point of attraction to a numher just now.

GAS TREATMENT OF WHOOPING COUGH.—In the treatment of whooping congh in gae worke, as lately resorted to, especially in London, the purifying chamber consists of a large room with doors and windowe freely open, and each contains 24 vessels, holding 5 cubic meters of depurating snbstance—lime and sulphate of iron mixed with sawdnst—throngh whioh the gas has to pass. When the workmen are emptying and refilling these vessels, the children with whooping cough are placed around it, and inhale the vapors which escape; they are in an atmosphere containing ammonium sulphide, carbolic acid and tarry products. As to the efficiency of thie treatment, one physician reports that of 120 cases persevered with, in 20 there was entire failure, 48 showed improvement, and the rest were cures; it is thought, however, that it acts only upon one element of the malady, viz., catarrh.

Academy of Sciences.

President Davideon's Annual Addree.

The reports of the officers convey to the members the details of the business of the Academy.

We have the satisfaction of knowing that a continued interst is manifested in the work of the members, and that a more general enoouragement is extended to our efforts to increse scientific study and investigation. Yet we cannot but acknowledge that we need more workers and spscialists in many valuable fields of research.

One main drawback to enlisting investigators is our present financial inability to print the proceedings of the Academy, either promptly as hulletins, when the interest and value of a communication wonld warrant it, or at the end of the year when the regnlar volume is closed. You have been assured personally by Agassiz, Hooker, Gray, Hayden and others that to impart vitality to such an institution, its proceedings mnst be systematically printed and spread abroad. In the rivalry which naturally exists among investigators, their scientific reputation depends upon their priority, as well as their ability. The principle and sentiment involved are as praiseworthy, and, in one sense, as valnable as the clsim for originality on the part of the inventor.

I believe if we had the means to print, that we should experience a large and lively

Interest in Original Work.

We are now five full years behind, but the matter has already been prepared by the unassisted labor of the Secretary for the printer, or for the examination of the publication committee; and certainly there appears no immediate prospect for bringing up the old work, or utilizing the new. We are still in debt for former publication. I am in full accord with the trnstees, who are the custodians of the propsrty of the Academy, and who for four yesrs have been endeavoring to reduce the indehtedness of the Academy incurred during the long commercial distress which pervaded the cosst.

They have managed the financial affairs of the Academy as they would their own private husiness, and have earnestly and conscientiously studied how best to hnshand our resources, and yet grant whatever "aid and comfort" was practicable. They have heen able to obtain the moneys needed for actual dishursements throu h their personal influence at the bank; and we know that whenever it is possible, they will afford the means for publishing. I have trusted that some public-spirited member would appear as a special bensficiary in

Establishing a Publication Fund;

And I still hope that with the prosperous days of trade we may awaken such a friend to the dissemination of scientific knowledge. The title pages of many scientific publications hear evidence of this liheral spirit.

For scientific research, the munificent

Endowment of Charles Crocker

Is so fresh in our memories that I need but refer to it to excite your admiration. That fund plainly means work, and we helieve that valuahle scientific and practical results will he derived from it. Upon my application to the trnstees, they have agreed to pay for the printing of a special bulletin of the Academy, in which I propose to give the short hut suggestive history of this hequest, for circnlation among the scientific societies of America and Europe.

Our donstions from correspondents and collectors throughont the coast continne large and valuable, although wsnt of room allows us to exhihit, for the present, only the most interesting. Much time has been given to the classification of our collections by the cnrators in mammals and birds, ethnology and osteology, botany and mineralogy. There is, however, so much material on hand that we can hnt regret the lack of work which prevents some of the departments from being properly attended to. To the library constant additions are being received from scientific societies, from individuals and through our representatives in Washington. Nevertheless, we miss several foreign exchanges on account of our not publishing.

As assistiog us in a practical, tangihle manner, I wish to mention the fact that our fellow-members, Messrs. Gerstle, Goldsmith, Wormser and Niebaum, have again gone upon my honds for the pnrchase of 2,000 gallons of alcohol in such quantities and at such times as it may be needed hy our wants. By this means we are enahled hy law to ohtain the alcohol for preserving epecimens of natural history without paying the tax thereon. Although the individual bonds are large, the gentlemen named promptly acceded to my reqnest.

It is the dnty of the president to notice the deathe of members duiing the year. So far as I have learned, the only member deceased since our last annnal meeting, is Mr. Henry Chapman, for many yeare, one of our most active cnrators and most modest members, yet full of practical intereet in our progress. The academy, very properly, at once expressed its loss and its sympathy with the family.

Again, I nrge upon our younger membere to file into the ranke of the workers, and to give to the academy some part of their time in classification and identification, as well ae the results of their investigations, whether tentative or final. Every search must yield some fresh information and elicit honest commendation. They need not he afraid of having their credit misappropriated, for it has been, to me, a eource of great satisfaction to have seen, in 10 years, among so many persons, so little of jealousy, and so much of hearty willingness to commend and encourage.

Among the many subjscts which naturally occupy the minds of our members, is the

Spread of Scientific Knowledge and Scientific Methode.

Its importance is manifested to us in a thousand ways, and being satisfied of its necessity, and the ripeness of the time for its agitation, I have ventured to put together a few snggestions npon the introdution of elementary science in our public school system, and upon the formation of sohools of trade, art, and commerce.

[This address we give in another column of this number.—EDITORS PRESS.]

Hydraulic Mining in Mono County.

From the Bodie *Free Press* of recent date we take the following account of what is being done on Mill Creek canyon by the Mono Lake Hydranlic M. Co.:

The hydraulic minss on Mill creek cover 20,080 acres, secured hy pstent, of gold-bearing wash gravel, some three miles in length hy one in width, commencing a little above the mouth of Mill Creek canyon, and extending down the creek in a southeasterly direction to within a half a mile of Mono lake. Work was commenced on the 10th day of October last on the big ditch, whose proposed dimensions were 5 ft. wide on top, 3 ft. on the bottom, 4 ft. deep and having a carrying capacity of 2,500 inches. Up to date it has been completed one mile from where it taps the creek to its present point of connection with the penstock. The latter is 50 ft. long, 4 ft. wide hy 3 ft. deep. There is now in use 300 ft. of the best Norway iron pipe, 24 inches in diameter at the penstock, and tapering down to 11 inches at the giant. The largest sized monitors with patent deflectors are used. The nozzles are 4½ and 6 inches in diameter, and under an 8-foot pressure the former is capable of throwing 500 inches, tbe latter 800. There is now only about 1,500 inches of water in the channel hed, and it is all required. The flume is 700 ft. long, snd it is being extended at the rate of 14 ft. per day. Its width in the clear is 48 hy 36 inches in depth. The hottom blocks are 10 inches hy 36 inches in diameter; lining hlocks 4 hy 18, with six sets of riffles: dip, 4 inches in 12 ft., while its gravel capacity is 4,000 tons every 24 hours, with 2,000 inches of water. Seventy thousand ft. of lumher have thus far heen consnmed in its construction. The hank is 53 ft. high, and in six days' work of ten hours each, with a 4 inch nozzle under an 80-foot head, 20,000 tons of gravel have heen washed down and flumed away.

The huildings consist of a boarding-house, lodging-house, office and blacksmith shop.

The creek, on leaving the canyon, makes a sweep from east to south ahout three miles to the lake. The company is now getting ready to lay its pipes from its present workings directly south to the lake, instead of following the old creek channel and commence cutting hsck on hed rock to the extreme northern houndary of its property. This manner of procedure will give it a fine tailing off or dumping plsce, save one and one-qnarter miles of flume and pierce the center of the claims, whose highest point is 900 ft. Ample fall will thus be secured. There is now enough pine timher of the hest quality standing on the claims along the creek to furnish hlocks for two miles of flume. All the water coming from the canyon has been secured by purchase snd pre-emption. They can also increase the number of inches to 5,000 when necessary. All that is required is five more miles of ditch, which csn he easily constructed, as the soil is good picking ground. There are two to five colors—and sometimes a dozen can he found—in every pan of dirt prospected on any part of the creek, or in its vicinity.

Through the exertions of Messrs. D. E. Jones and J. D. Wilson, the company was organized and incorporated at San Francisco, on Septemher last, with a capital stock divided into 100,000 shares—par value, $10 per share—with the following named officers and Board of Trustees: President, J. D. Wilson; Vice-President, George Duncan; Secretary, John Elbert; Trustees—George Duncan, J. D. Wilson, D. E. Jones, John Elhert and —. Curtis. The company now employs 20 men with D. E. Jones as Superintendent; J. Wilson, assistant; L. Jacohs, foreman; W. Brownlee, assistant night foreman. The two latter-named gentlemen are old, experienced Dutch Flat miners, and expree themselves pleased with the outlook. The company has already expended $15,000, and is going to show to the people of Mono county that a veritable placer honanza existe in our midst, and that capital and skill will yet extract hidden millions from around the desolate shores of Mono lake.

WORK FOR ALL WHO WANT IT.—Just at present, and for the remainder of the winter, Wood River will he hlest by a demand for laborers, which is unusnal in the early history of mining camps. The husiuese of cutting ties for use in building the Oregon Short Line hranch of the Union Pacific railroad affords employment at very remunerative rates to all laborere who want work. There is therefore no need for any man to be idle on Wood River this winter, as all who are willing to work can earn from $3 to $4 a day.—*Wood River Times.*

MECHANICAL PROGRESS.

A New Motive Power for Street Cars.

The problem of finding some cheap, convenient and easily-applied motive power to take the place of horse power for street cars, is one that has engaged the attention of scientists and practical mechanics for some years, but thus far without any marked success. Now, as we understand, an entirely new departure has been taken, and it is claimed that a practical motive power has been discovered, which will meet the long-felt want. Quite recently articles of incorporation were filed by the United States Spring Car-Motor Construction Co., an organization originating in New Jersey and Philadelphia, which expects in a little while to revolutionize the existing methods of propelling single passenger cars on streets and elevated railroads. Two inventors, Samuel Anstin and Robert Steel claim to have successfully solved the problem of a cheap and easily-controlled motive force to take the place of horses in street car propulsion. They propose to do it by powerful steel springs operating upon an endless chain, and the above company has been formed to manufacture trucks containing the mechanism.

The great difficulty hitherto has been the impossibility of manufacturing the springs in this country, which it is claimed has been overcome. Springs of a similar pattern have been made in various parts of Europe, and to a considerable extent practically utilized as applied to invalid carriages and other conveyances in France and elsewhere. The inventors believe they have hit upon a process of making the springs, and have been able to so fer demonstrate their claim as to secure the capital necessary to make a practical test of the invention.

Ten of these coiled springs are to be set in an ordinary car truck, and in appearance, as well as in operation, they will resemble the main-spring of a watch of massive proportions. They will exert their power upon endless chains operating upon the wheels. Each spring will be inclosed in a hand or clamp, so arranged that by the simple movement of a lever, answering to the brake now in use, each clamp will be compressed upon the springs, closing them altogether, and not only shutting off the power, but holding the wheels at a standstill. Then when the pressure of the lever is taken off, the force exerts itself, and the car will be started. When wound up, as they will be each trip or two, at the end of the route, by a stationary engine, each spring will be about sixteen inches in circumference. By a very ingenious idea in construction, the inside end of the spring is the largest, and it tapers from nine inches to one inch in diameter. This causes the pressure to increase as the spring unwinds, and makes it greater just before it expends itself than at any other time. The length of time a spring will last probably remains to be determined, but the inventors claim that the springs will certainly preserve their elasticity for at least four or five years, providing each single spring is not kept in continuous service.

The Increasing Use of Glass.

There seems to be an impression of late that glass must soon come into a much more general use than it now obtains. It has been suggested as a suitable material for water mains, for street lamp-posts, and for many other purposes for which cast iron is now used. Mr. Siemens proposes to prepare a toughened glass for these purposes. He claims that he can prepare a glass which will be much stronger than iron castings, imperishable and incorodible. The cost per pound, allowing more profit to the maker than can be obtained from iron, is twice as much the cost of the latter, but the specific gravity is so much less that the consumer will be able to obtain glass articles about 33% cheaper than similar goods in cast iron.

Some of the Pittsburg glass makers are proposing to use it in the form of blocks, like granite or marble, for structural purposes. One writer says: "Perhaps not one builder or contractor in 10, if told that the common grades of glass have a crushing strength nearly four times as great as that credited by experienced engineers to the strongest quality of granite, would accept the statement as true. Yet it is a fact, and being so, the query as to why glass has not received more attention from architects as a structural material naturally suggests itself. A reporter had a talk with several prominent glass manufacturers on the subject, and in answer to an interrogatory as to whether blocks of glass could be made in suitable lengths and sizes and so annealed as to be utilized in the construction of a building in place of stone, they said that it could be done. Said one of these gentlemen:

"'This question has been considered by myself a number of times, and, although I do not want to advocate the absolute abolition of brick and stone, yet in the erection of art galleries, memorial buildings, etc., a structure composed of blocks of glass in prismatic colors would be alike a unique, beautiful and lasting structure. With the numerous inventions which have come into use of late years in connection with the production of glass, the cost has been gradually going down while the quality of the fabric is steadily becoming better. One objection which would be raised to the durability of a glass house, might be that the blocks would not take a bind or adhere together with common mortar. This objection can readily be set aside by the use of a good cement, and when completed the structure would stand for ages, barring extraordinary accidents, or, mayhap, cataclysm. As to the cost of a glass house, it can be kept down to but a small percentage above the price of cut granite, as there are many points where saving gains can be made. Thus, for instance, in building with stone, you have to pay the stone masons, and when it comes to elaborate examples of carving, in Corinthian pillars, collars and capitals, etc., why, the work is rather costly, as compared with glass, when the latter can be molded in any shape or form, and the work accomplished in much less time. I am convinced that the time will come when we will see such a building erected.

"'Scarcely a day passes that the sphere of glass as an article of use does not become widened. In parts of Germany and on one line in England, glass ties are being used on railroads, and thus far have given satisfaction, combining all the requisites of the wooden tie with the virtue of being susceptible to usage at least 75% longer than wood. Progress is also being made toward rendering glass ductile, and to-day threads of glass can be made that can be tied in knots and woven into cloth. Were one disposed to give play to fancy and fuse it into fact, a house entirely composed of glass could be built with walls and roof and floors fashioned from melted sand. Carpets of glass could cover the floors, the wall decorations embodying the forms and colors of the most ultra æsthete; sitting on glass chairs or reclining on glass couches, and arrayed in glass garments, eating and drinking from glass dishes, such an one could realize that the age of glass had come. Yet nearly all of this 50 years ago would have been classed with the then impossible telephone and electric light, and this statement would likely have found its place in the catalogue *Expurgatorius*."

IMPROVEMENTS IN LOCOMOTIVE BUILDING.—Inventors have shown a disposition of late to depart altogether from the old and seemingly well-established general form of locomotive engines. A great many changes have been made in the details of locomotive construction since its early days, but the machine itself still remains the same in general appearance. The Wooten dust-burning engines present a somewhat different form, and the Fontaine, with its main driving-wheels and most of the machinery above the boiler, is still more novel in the arrangement of parts, though most of its outline remains the same. Another new locomotive—Dr. Rauh's—does not at all resemble the ordinary locomotive, except that it has wheels and a cow-catcher. The boiler or boilers extend from end to end. The smoke-stack, steam dome, cylinders and driving gear are all in the center, grouped together under the cab. The purpose of this construction is to get the center of gravity in the center of the base formed by the driving-wheels, and to put the motive power also in the center. If one of Dr. Rauh's locomotives should be cut in four quarters, each quarter would be exactly like the other quarters in form and weight. Whether these new forms are practically better than the old remains to be proved by actual work, but it is a good thing for inventors to get rid of the notion that they are bound to follow closely an adopted form or system while seeking to make improvements. Habit, custom and prejudice are so many dead weights on inventive genius. They should not enslave the mechanic, however, though he, more than anyone else, needs to know what has been accomplished, and why certain forms have been adopted.—*Ex.*

IRON WIRE.—Some of the anomalies presented in the expansion and contraction of iron wire, as observed by Prof. Norris, have led him to the conclusion that in steel and iron containing free carbon, there is a contraction or shortening which is excited by heat, and which proceeds simultaneously with the dynamical expansion and marks its true amount; this is divisible into high and low temperature contraction. In cooling a strained iron wire from redness, it was found that the contraction due to cooling was, at a certain point and for a limited period, changed into action of elongation; in good iron wire this irregularity could not be detected, but in hard wire and steel was very apparent. The wire has to be raised to a very high temperature before the temporary elongation during cooling can be seen, and it does not take place if the wire is heated only just beyond the temperature at which it occurs.

A NEW VARIETY OF GLASS.—A Vienna chemist has recently devised a new variety of glass. It does not contain any silica, boric acid, potash, soda, lime or lead, and is likely to attract the attention of all professional persons on account of its peculiar composition. Externally, it is exactly similar to glass, but its luster is higher, and it has a greater refraction, of equal hardness, perfectly white, clear, transparent, can be ground and polished, completely insoluble in water, neutral, and it is only attacked by hydrochloric or nitric acid, and is not affected by hydrofluoric acid. It is easily fusible in the flame of a candle, and can be made of any color. Its most important property is, that it can be readily fused onto zinc, brass and iron. It can also be used for the glazing of articles of glass and porcelain. As hydrofluoric acid has no effect on the new glass, it is likely to find employment for many technical purposes.—*Wiener Gewerbe Zeitung.*

SCIENTIFIC PROGRESS.

No Organic Matter in Meteors.

A Louisville (Ky.) paper reports an interview with Prof. J. Lawrence Smith, of that city, in the course of which Mr. Smith gave reasons for discrediting the reported discovery of organic substances in meteors, as claimed by Prof. Hahn, of Berlin. Mr. Smith said:

"Although I have probably examined more microscopic plates of fragments of meteorites than any other person, still I have never discovered anything like organic remains in any of them. Besides, the well-known chemical composition of these bodies is averse to the existence of any such remains as spoken of by Prof. Hahn. Were these remains present, we should discern carbonate of lime on their interior. The two or three that have any carbonate of lime were discovered and analyzed by myself, and in these cases the carbonate of lime was an accidental constituent of incrustation deposited on the surface after their fall. In the microscopic examination of these polished plates of meteorites the two predominating minerals, enstatite and bronzite, will, by their fissures and forms, sometimes remind one of vegetable and other organic forms, but the merest tyro of an observer will trace here nothing but a rare resemblance. And, furthermore, the very ingenious nature of these minerals precludes the possibility of organic remains, even in terrestrial minerals of similar kind. Not knowing of any eminent German geologist named Prof. Hahn, I thought it but reasonable and logical that I should inquire something about him from my friend Prof. Hawes, now in the employ of the Smithsonian Institute, and the best lithological microscopist in this country, and who recently returned to this country after 10 years' study with Prof. Rosenbaum and others into the microscopic character of rock. In answer to my inquiries, Prof. Hawes wrote me this letter:

"'I read that paper of Prof. Hahn's. He is a kind of half-insane man, whose imagination has run wild with him. These forms which he so accurately describes and figures have long been known to exist in meteorites, and have been frequently described by mineralogists and microscopists. They are mainly composed of enstatite or bronzite in radial forms, and fractured in such a peculiar manner as to give them the appearance of structure. Some of the American meteorites which I have examined show these forms in great beauty, but Prof. Hahn is the only man who has seen anything organic in them, and his paper has excited nothing but ridicule. It reminds one of the long and laborious research of a German professor who found a whole flora and fauna, which he named with double Latin names, and which he found in his microscopic examination of basalt.'

"It is very clear to my mind," continued the professor, "that these cranky observations, viewed with the spectacles of the imagination of Prof. Hahn, have obtained more publicity than they merit."

Comets.

Mr. W. Mattieu Williams, the manager of the Royal Polytechnic Institute of London, recently delivered a very interesting lecture on "Comets." These erratic visitors, he observed, are very numerous, Arago estimating their number at 17,500,000. The lecturer explained how these figures are arrived at, and described the method of sweeping the heavens with a telescope in search of comets. He showed on the screen the appearance presented on the first observation of a comet and the gradual growth of its tail. He also exhibited the portraits of various historical comets, and described the circumstances connected with their appearance. He especially referred to the investigations of Donati on the comet bearing his name, and the manner in which the luminous matter of the nucleus is first thrust out toward the sun and afterwards repelled from it to form the tail. He indulged in some speculations as to the composition of comets' tails, and the very difficult problem which their sweeping round so rapidly presents. He then went on to touch on the probable effects of a collision between a comet and the earth, exemplified by instances of some approximate collisions that have occurred, and concluded with an account of the observations of Dr. Huggins and other astronomers on the recent comet, as to its chemical composition, as revealed by spectrum analysis. Mr. Williams is organizing an exhibition of scientific inventions of a popular character.

Stone, Bronze and Iron Ages.

Prehistoric archæology advances rapidly. It is not so very long ago since Worsaae's epoch-making book first firmly established the primitive division of the early human past into the three ages of stone, of bronze and of iron. Then came the discoveries of Boucher de Perthes and others, systematized by Lyell, which resulted in the recognition of that still earlier stone period described by Sir John Lubbock as paleolithic. Since that date the archæologists of France and England have advanced to a regular classification in order of time of the vast heterogeneous collection of human remains belonging to the elder stone age; but the result of their researches has hardly yet obtained sufficient general recognition outside the restricted scientific circle. It is probable that most cultivated people still continue mentally to divide the prehistoric period into three ages of stone, bronze and iron, and to subdivide the first-named age into a paleolithic neolithic epoch. In reality, such a division, though practically convenient, is grotesquely disproportionate. The so-called stone age is made to extend over an enormous lapse of time, and to include portions of the geological tertiary period, the whole of the quaternary, and part of the recent; while the small remainder of the recent period is handed over to the bronze and iron ages. This scheme is almost as absurd as a division of English history into the Victorian, the Georgian and the pre-Georgian epochs, the last named being subdivided once more into the Anglo-Saxon and Elizabethan periods. French Archæologists have far more correctly recognized six main divisions of prehistoric time, the first five being equivalent to what we ordinarily describe as the paleolithic age, and the sixth comprising the neolithic, bronze and iron ages of the recent period of the geologists. It is only by such a stricter and more chronologically accurate subdivision that we can properly appreciate the great slowness of human evolution in its earlier stages, and the vast lapse of time covered by the so-called paleolitheic period.—*Pall Mall Gazette.*

American Ferro-Manganese.

The amount of speigeleisen and ferro-manganese annually consumed in the United States is about 30,000 tons, by the aid of which we are enabled to produce about 150,000 tons of Bessemer and open-hearth steel. A small portion only of the metallic manganese used here is produced in the United States, and that chiefly from Spanish ores. The rest is imported from Europe.

This should not be, since it is well known that we have fuel and labor in abundance here, and plenty of a good quality of manganese ore, especially in the Southern States. In fact, we are, to some considerable extent, exporting the ore to Europe, where it is manufactured into ferro-manganese, or spiegeleisen, and returned to us again as a metal to enter into our Bessemer steel product. We ought to utilize more fully the products of nature with which we are so abundantly supplied, and employ our own labor not only in working our manganese mines, but also in reducing the ore to its metallic result.

COLORED GLASS.—Much has been said about the inability of modern glass manufacturers to make window glass imbued with the rich and beautiful colors peculiar to the windows of old cathedrals in England and on the continent. It is not generally known, however, that the secret of securing those wondrous tints has been discovered by one of our glass manufacturers. After a long series of experiments conducted in conjunction with Mr. Thos. Garfield, of Boston, a cousin of the martyr President, he has found that the rich effects in those old cathedral windows are owing to the poorness of the quality of the glass. Owing to the imperfect mixing of the ingredients by the old glass makers, the substance did not unite closely, and in consequence it became porous, and the minute particles of soda in the composition are exposed and act in the function of radiators, which give brilliancy to the colors of the window. In making window glass in colors now, the makers prefer to leave the surface rough, in order that by exposure to the elements it may go through the same beautifying process alluded to above.

EARTHQUAKES.—Dr. K. Von Fritsch, of Halle, says that the cause of earthquakes does not exist further down from the surface of the earth than 10 or 14 miles. After citing a number of instances to show how far the shock of a steam hammer or that produced by an explosive may be felt, he appears convinced that rather feeble forces produce earthquakes, which make themselves very sensibly apparent at great distances from the active center. He says that earthquakes might be and must be produced by the increase and decrease of volume of rocks under the influence of physical and chemical forces, and by concussion by the opening of crevices in rocks, and by the subsidence of masses of rock due to these agencies. Many shifts are subjected to extension stress, and when crevices occur the schists must enter into oscillations like those produced in tuning plates.

THE MILKY WAY.—Many astronomers, from Herschel downward, have spent much time in speculating upon the structure and functions of the great stellar streams known as the Galaxy or Milky Way. This part of the heavens has recently been made an object of careful study by M. Honzeau, of Brussels Observatory. He has indicated its composition by means of curves of equal luminous intensity. Looking casually at the Milky Way, one might be disposed to think it luminously nearly the same throughout. But M. Houzeau finds it in a series of luminous plates or masses, to the number of 33, each diminishing in brightness outward from the center. These are arranged almost exactly along a great circle of the celestial sphere. The solar system is nearly in the plane of this equator, and probably near its center.

THE bullion production of Utah promises to be the largest in many years, and the outlook for the coming year is more encouraging than ever.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Dec. 22.		Week Ending Dec. 29.		Week Ending Jan. 5.		Week Ending Jan. 12	
Alpha	2.95	2.80	2.60	2	2	....	2	1½
Alta	4¼	3.85	4.05	3.90	4.35	4.15	4¼	4.05
Andes	1.90	85c	85c	80c	89o	70c	80c	55c
Albion	1.95	1·60	1.80	1¼	1.90	1¼	1¾	1.60
Argenta	....	....	....	....	....	....	....	....
Addenda	10c	....	....	....	....	....	10c	....
Belcher	1.90	1¼	1.85	1.60	1.85	1.60	1.55	1.35
Belmont	60c	....	75c	70c	....	....	6·c	....
Best & Belcher	8¼	7¾	7¾	7¼	7¾	7¼	7¼	6¼
Bullion	1.65	1¼	1.40	1.35	1.30	1¼	1.20	85c
Bechtel	20c	15c	10c	....	....	....	35c	30c
Belle Isle	....	....	....	....	....	....	....	....
Bodie	3¼	3	2.90	2.60	2¼	2.45	2¼	1
Beaton	80c	70c	70c	65c	75c	....	75c	65c
Bulwer	2¼	....	2.70	2.65	2.90	2¾	2.60	2¼
Boston	50c	....	....	....	60c	50c	60c	....
Black Hawk	....	....	....	....	....	....	....	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	10c	....	5c	....	5c	....	30c	25c
California	50c	40c	35c	2·c	35c	30c	35c	25c
Challenge	60c	5 c	55c	....	60c	....	50c	4·c
Chollar	1.45	1.30	1.15	1	1.20	1.05	1.15	85c
Confidence	2¾	2¼	2.40	2¼	2¼	2.05	2.05	2
Con Imperial	10c	....	5c	....	5c	....	5c	....
Con Virginia	1.60	1.30	1.35	1	1.10	75c	90c	70c
Crown Point	1¼	1.05	1.10	90c	1.15	1	95c	90c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1¾	1¾	1½	1.40	1½	1.40	1	80c
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	2¼	2.45	2¼	2.15	1.85	....	1.65	1
E. Mt. Diablo	40c	35c	....	....	40c	35c	35c	....
Eureka Con	14	13	13	11½	13	12½	13	....
Exchequer	1.10	1	1	85c	1	90c	80c	75c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	2¼	2.05	2.15	2	2.20	1.95	2	1.80
Goodshaw	25c	....	20c	10c	25c	....	15c	....
Gould & Curry	5¼	4¾	4.40	3.60	4.05	3¾	3 65	3.40
Hale & Norcross	2¼	1¾	1.80	1.60	1.70	1.40	1.35	1¼
Head Center	50c	....	40c	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	....	....	10c	5c	10c	....	10c	5c
Justice	75c	65c	75c	60c	70c	60c	65c	55c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	1	45c	1¼	60c	....	....	....	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	5c	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	2	....	1¾	1.40	....	....
Martin White	3.05	2¾	2¾	....	....	....	2¼	....
McClinton	....	....	....	....	....	....	....	....
Mono	80c	60c	60c	....	70c	40c	80c	55c
Mexican	10¾	9¾	9¾	8¾	10	9¼	9¼	8¾
Mt. Diablo	7	6¼	7	6¾	7	6¼	6¾	6¼
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	35c	25c	25c	....	30c	15c	15c	5c
New York	....	....	....	....	....	....	....	....
Northern Belle	9¾	9	8¼	....	8¾	8¼	8	7¼
North Noonday	35c	30c	....	....	25c	5c	5c	....
Navajo	20c	15c	25c	20c	25c	....	30c	25c
Occidental	....	....	....	....	....	95c	....	....
Ophir	6¾	6¼	6¾	5¾	6	5¼	5¾	5¾
Original Keystone	....	....	....	....	....	....	....	....
Overman	12	1.30	1.45	1¼	1¾	1.30	1¼	90c
Oro	25c	15c	20c	1·c	20c	15c	15c	10c
Paris	....	....	....	....	....	....	....	....
Potosi	1¾	1.40	1.40	1.35	1¾	1.40	1.40	1¼
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	2.90	2	2.05	1¾	2	1.45	1.40	1¼
Seg Belcher	5	....	....	....	5¾	....	4.80	....
Sierra Nevada	10¾	9	9¾	8¾	9¾	8¾	8	7¼
Silver Hill	30c	25c	25c	1·c	20c	1·c	15c	10c
Silver King	19¼	18¼	19¼	19	19¾	19¼	19¾	19¼
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	1.35	1.10	1.20	1.05	1.15	1.05	95c	90c
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	20	....	20c	....	20c	....	....	....
Tioga Con	....	....	....	....	10c	....	5c	....
Tiptop	....	....	3¾	2¾	4	....	4¾	4.70
Tuscarora	....	....	....	....	....	....	....	....
Union Con	16¾	14¾	15	13¾	15	13¾	12¾	11¾
Utah	7¼	6¼	....	....	6¾	6	5¾	5¼
Ward	3.60	....	3¾	....	3¾	....	3¾	....
Wales	55c	....	75c	....	55c	50c	75c	60c
Yellow Jacket	4.40	3.60	3¼	3.10	3.40	3.05	3.10	2¾

Sales at S. F. Stock Exchange.

Thursday A.M., Jan. 12.

25	Alpha	300	Silver Hill.....15c
450	Alta.....4.10@4.05	215	Scorpion.....95@90c
850	Andes.....80@75c	20	Utah.....5¼
220	B & Belcher.....7¼	390	Union.....10¾@10½
620	Bullion.....85c	190	Yellow Jacket.....2¾
250	Benton.....70c		AFTERNOON SESSION.
150	California.....35c	350	Addenda.....5c
450	Con Virginia.....90c	180	Bodie.....2¼@2.45
40	Chollar.....1.15	200	Bechtel.....30c
15	Confidence.....2	100	Bodie Tunnel.....1.10
1000	Con Imperial.....5c	400	Concordia.....1
100	Challenge.....50c	700	Day.....1.05@1
280	Gould & Curry.3.65@3.60	75	Eureka Tunnel...2.05@2
200	Golden Gate.....1.90	10	E Mt Diablo.....35c
155	Hale & Nor.....1.30	50	Goodshaw.....25c
325	Justice.....60@65c	25	Mt Diablo.....7@7¼
60	Julia.....10c	150	M White.....2.45@2.40
200	Lady Wash.....5c	75	Mono.....60c
510	Mexican.....8¾@9	10	Navajo.....25c
665	Ophir.....5¼@5¾	50	Oro.....10c
415	Overman.....10@30c	20	Pay Day.....1
170	Sierra Nevada.....7¾@7¾	100	Silver King.....19½
15	Seg Belcher.....4.90	190	Wales.....60c

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Ontario, Jan. 6th, $46,630; Hanauer, Jan. 6th, $2 300; Germania, Jan. 6th, $2,850; Barhee & Walker, Jan. 6th, $3,415; Bullionville, Jan. 6th, $2,407; from Silver City, Idaho, Jan. 6th, $8,65S; Buffalo, Idaho, $8,800; Horn Silver, Jan. 6th, $6,S50; Germania, Jan. 6th, $2,800; Horn Silver, Jan 5th, $30,000; Northern Belle (for Decemter), $79,750; Jan. 4th, $4,469; Horn Silver, Jan. 5th, $12,500; Indian Queen, Dec. 31st, $9.145; for month of Decemher, $22,293; Savage, Dec. 21et, $18,250; Northern Belle, Jan. 2d, $8,020; Standard, Jan. 2d, $21.56S; Noonday, Jan. 3d, $14,473; Contention, Jan. 3d, $11,170; Indian Queen, Jan. 1st, $9,145; Northern Belle, Jan. 4th, $4,169; Eureka Con., Jan. 4th, $8,704; Bodie, Jan. 9th, $7,0S0; Tip Top, Jan. 8th, $19,000; Syndicate, Jan. 7th, $8,044; Northern Belle, Jan. 7th, $6,456; Star, Jan. 6th, $2,733; Contention, Jan. 6th, $15,736; Leeds, Jan. 9th, $1,575; Silver Hill, Jan. 7th, $3,351; Head Center, Jan. 10th, $7,862.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Albion Con M Co	Nevada	9	30	Nov 25	Dec 29	Jan 19	D B Chisholm	327 Pine st
Alta S M Co	Nevada	22	50	Dec 16	Jan 20	Feb 9	W H Watson	302 Montgomery st
Belmont M Co	Nevada	30	15	Nov 11	Dec 19	Jan 16	J W Pew	310 Pine st
Best & Belcher M Co	Nevada	22	50	Jan 4	Feb 7	Feb 23	Wm Willis	309 Montgomery st
Bodie Con M Co	California	1	50	Dec 6	Jan 14	Feb 13	W H Lent	309 Montgomery st
Bechtel Con M Co	California	8	25	Dec 3	Jan 9	Jan 30	W H Lent	309 Montgomery st
Caledonia S M Co	Nevada	38	25	Dec 6	Jan 7	Jan 26	R Wegener	414 California st
Chollar M Co	Nevada	7	25	Jan 9	Feb 14	Mar 7	W E Dean	309 Montgomery st
Con Imperial M Co	Nevada	17	10	Jan 4	Feb 8	Mar 1	W E Dean	309 Montgomery st
Hale & Norcross M Co	Nevada	72	75	Dec 21	Jan 25	Feb 16	J F Lightner	309 Montgomery st
Kentuck M Co	Nevada	17	30	Nov 23	Jan 3	Jan 23	J W Pew	310 Pine st
Lady Bryan S M Co	Nevada	6	25	Dec 5	Jan 10	Jan 29	O V D Hubbard	310 Pine st
Mono G M Co	California	15	50	Dec 5	Jan 10	Jan 31	W H Lent	309 Montgomery st
Navajo M Co	Nevada	15	15	Dec 3	Jan 17	Feb 8	J W Pew	310 Pine st
Noonday M Co	California	5	25	Dec 30	Feb 6	Mar 2	W J Taylor	310 Pine st
North Noonday M Co	California	5	25	Dec 30	Feb 10	Mar 6	W J Taylor	310 Pine st
North Standard G & S M Co	Cal	2	10	Nov 30	Feb 1	Feb 20	O V D Hubbard	310 Pine st
Original Keystone S M Co	Nevada	6	50	Dec 8	Jan 12	Feb 4	F E Luty	330 Pine st
Overman S M Co	Nevada	52	50	Jan 9	Feb 14	Mar 7	Geo D Edwards	414 California st
Pinal Con M Co	Arizona	1	25	Nov 19	Dec 27	Jan 16	W W Traylor	309 Montgomery st
Seg Belcher M Co	Nevada	20	1 00	Dec 5	Jan 6	Jan 24	G D Edwards	414 California st
Sierra Nevada S M Co	Nevada	71	1 00	Dec 29	Feb 1	Feb 20	E L Parker	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	4	03	Dec 27	Jan 30	Feb 17	J M Buffington	309 California
Bay State S M Co	Nevada	1	02	Dec 29	Feb 6	Mar 6	J W Pew	310 Pine st
Buckeye M Co	California	4	50	Nov 10	Dec 19	Jan 19	W H Lowden	213 Sansome st
Lutte Creek Hydraulic M Co	California	8	10	Dec 29	Feb 15	Mar 6	A L Taylor	230 Montgomery st
El Dorado W & M Co	California	19	75	Nov 12	Dec 22	Jan 16	R M Welch	524 Sacramento st
Excelsior Deep Grav M Co	California	17	25	Jan 10	Feb 14	Mar 7	D B Chisholm	327 Pine st
Horseshoe M Co	Arizona	1	02	Nov 30	Jan 4	Jan 23	J H Sayre	330 Pine st
Mayhelle Con M Co	California	10	20	Dec 31	Feb 7	Mar 1	W J Taylor	310 Pine st
Mayflower Grav M Co	California	14	10	Dec 30	Feb 3	Feb 23	J Morizio	323 Montgomery st
McElroy Grav M Co	California	6	10	Dec 20	Jan 24	Feb 11	L Lillie	607 Washington st
Santa Anita M & M Co	California	2	02	Dec 14	Jan 16	Feb 2	J B Titus	24 Kearny st
University G M Co	California	10	10	Dec 13	Jan 19	Feb 9	W L Oliver	328 Montgomery st
Wide Awake Prospecting & M Co	Arizona	15	10	Dec 6	Jan 12	Jan 30	C Hilgebrandt	Chronicle building

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alexander M Co	——	A B Cooper	328 Montgomery st	Annual	Jan 27
Blue Bell Con M Co	——	H P Bush	431 California st	Annual	Jan 18
California M Co	Nevada	C P Gordon	309 Montgomery st	Annual	Jan 18
Iowa M Co	California	C C Leavitt	411½ California st	Annual	Jan 20
Kossuth M Co	——	E F Stone	306 Pine st	Stockholders	Jan 16
Rainbow G M Co	——	J C Chalmers	435 California st	Annual	Jan 16
Sierra Nevada S M Co	Nevada	E L Parker	309 Montgomery st	Annual	Jan 18
South Spring Hill M Co	——	W H Reynolds	320 Sansome st	Special	Jan 16

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Alexander M Co	——	A B Cooper	328 Montgomery st	2 00	Dec 28
Black Bear Quartz M Co	California	W. Letts Oliver	328 Montgomery st	20	Dec 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Jan 12
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Jan 16
Silver King M Co	Arizona	J Nash	315 California st	25	Jan 16
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Jan 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	75 (extra)	Jan 12
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10	Jan 3
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10 (extra)	Jan 3
Western M Co	California	C S Curtiss	309 Montgomery st	75	Dec 22

The Mining Share Market.

There is very little of interest to say concerning the mining share market; our tables shows what slight fluctuations have occurred. The *Enterprise*, in speaking of the situation, says: As we can hear of nothing in the mines to cause any tumble, the cause must be sought for in some other direction. All work is going on favorably at the north end, and the ground that is being explored, is of a very promising character. The south drift on the 2700 level, from the main drift run between the Union shaft and the joint Union Consolidated and Sierra Nevada mine, is out but a short distance. It is finding good seams and bunches of quartz, but must go some 150 ft in order to reach the point where it is expected an ore body will be found.

The north drift of the 2700 station of the joint Mexican and Union Con. winze is beginning to cut stringers of quartz that yield promising assays. This drift is going into a very interesting section in which good assays were obtained on the level above from the several drill holes run. Indeed, there are a number of points at the north end from the 2500 down to the 2,800 level, where ore is liable to be found almost any day.

The main east drift on the 2900 level of the Ophir and Mexican is still in gronnd of a very favorable character, with no sign of an east wall.

At the old bonanza mines they will soon be in a position to make extensive explorations, not only in said mines, but also in connection with the Best & Belcher and Gould & Curry.

The Savage folks are now making it their chief business to connect their main incline with their 2400 level. Once they get a hole through at said point, it will give a circulation of air that will be of great importance to all the middle mines, and we may then expect to see work commenced in earnest in the Hale and Norcross and Chollar and Potosi mines.

The Yellow Jacket folks are now exploring ground that shows many seams and feeders of quartz that give low assays. At the same time the general appearance of the grounds is very favorable.

The Imperial folks are again fairly at work on their lower levels, and in the east drift on their 2800 level are finding streaks of quartz that promise to lead to ore.

At the Alta, Overman, Crown Point and Belcher, work is progressing favorably, and at American flat work has been resumed in the Baltimore at a point where there is already in sight a considerable streak of ore.

The Gunsight mine, Meyers district, Arizona, is claimed to be the biggest kind of a big bonanza. It is backed by Hon. Samuel P. Ely, one of the great iron manufactnrers of Marquette, Michigan, who, after an inspection of the mine, advanced the necessary money for its development and up to the time of the organization of the present company, had expended $80,000 on the mine.

Meetings and Elections.

Vulcan Powder Co.—Jan. 10. Directors—S. Heydenfeldt (President), J. Baum (Vice-President), Wm. Ashburner, F. J. Lebreton and Julius Jacobs. Shainwald was appointed Secretary. The affairs of the company were proved to be in the most prosperous condition.

South Hite M. Co.—Jan. 9. Directors—L. A. Booth (President), T. A. Mudge, S. D. Osborne (Vice-President), W. H. Widman, F. A. Beslin (Secretary).

Silver King M. Co.—Jan. 9. B. A. Barney, President; J. L. Jones, Vice-President; James M. Barney, Treasurer and General Manager; R. M. Phillips, Superintendent; Joseph Nash, Secretary. Directors—W. H. Stanley. Aarou Mason, James M. Barney, J. L. Jones.

Argenta M. Co.—Jan. 9. Directors—J. L. Browne, J. E. Dixon, Thos. Cole, George Congdon, W. H. King.

Leviathan M. Co.—Jan. 9. Directors—H. A. Deming, L. W. Boyer, R. W. Heut; C. F. Tolford, G. P Thaller. H. A. Deming, President; L. W. Boyer, Vice-President; B. B. Smith, Secretary.

Gila M. Co.—Jan. 9. Directors—G. W. Handy, Jno. Hammond, E. P. White, Mowry W. Smith, J. M. Hinkle, G W. Handy, President; Jno. Hammond, Vice-President; J. T. McGeoghegan, Secretary.

Pacific Stock Exchange.—Jan. 9. Directors—President, C. L. Weller; Vice-President, Baldwin Gardiner; Secretary, F. L. Unger; Assistant Secretary, S. F. Clough. Executive Committee—T. Whitney, F. Franks, D. Rich

S. F. Stock Exchange Co.—Jan. 9. Committee on elections: C. W. Fox, M. P. Hall, S. Dixon, C. H. Stoutenborough, O. V. Walker, J. S. Wilson, S. B. Boswell. The old officers were elected with the exception that Mr. Wakefield was elected Vice-President in place of Mr. Schmiedel, who declined to run.

Albion Con. M. Co.—Jan. 12. Directors—L. I. Robinson, Thomas Bell, S. Heydeufeldt, Henry Pichoir, Henry T. Scott, Clinton Gurnee, Sydney M. Smith. The Secretary's report shows that the company received during the year 1881 the sum of $217,086,77. Of this sum, $196,520.10 was in the shape of assessments, and $3,520.52 from the sale of ore. The amount of cash on hand to date is $4,949.58.

Town Sites and Mineral Claims.—Acting Attorney-General Phillips, on the 24th ult., submitted to the President his opinion in regard to the Tombstone, Arizona, cases, which was to-day referred to the Interior Department. The opinion is, in substance, that the location of town sites cannot deprive persons of mineral rights, who have previously acquired and previously pre-empted mineral land. They have lawfully the right to go ahead and take out the mineral in the ground of the town site, but they must not destroy any of the town improvements or streets; that its surface may be preserved for the town, but the mineral underneath the surface belongs to the parties who have pre-empted the mineral land there, but that the mineral must be taken out without detriment or injury to the town.

Adolph Sutro has sent a large lot of books to the public schools of Sutro, Nevada, recently, and has given $600 each to the Almshouse and City and County hospital in this city, for the purchase of reading matter.

The Sutro Tunnel company have built an ore dump near the mouth of the tunnel with the intention of extracting low-grade ore when their connection with the Forman shaft is completed.

About 90 tons of ore are daily extracted from the Crown Point and milled, averaging $14 per ton.

Fifty tons of low-grade ore are daily extracted from the Belcher.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Pipe Collapsed.—Amador *Dispatch*, Jan. 7: Last Wednesday when the water was turned into the Plymouth branch of the Amador canal, a collapse of 750 it occurred in the pipe crossing Amador creek. This cast a temporary gloom over the brow of Supt Towne, but he at once sent below for more iron, and will have the pipe replaced as soon as the work can be accomplished.

Upper Rancheria.—Evans & Fitzgerald are ready to send off a few debris and sluicens as soon as water can be got through the Volcano ditch. A rich Chinese merchant from Oleta has a company of Chinamen fixing up the old Rice claim at Rancheria with the intention of working it this winter. They are putting on a hydraulic to be worked with a little giant Strickland & Co. commenced piping again last Tuesday morning, but they will have to close down again in a few days if it doesn't rain.

Loyal Lead.—*Ledger*, Jan. 7: The grading of the mill site is progressing. It is understood that arrangements have been made with the North Gover Co., for the leasing for a term of years of the suitable mill site upon which grading work is progressing. The 20-stamp mill of the Pennsylvania has been purchased and moved, ready to be erected on the new site. There is no prospecting or work of any kind going on in the Loyal Lead. The impression is, however, that the mill is being erected mainly with a view to crush the quartz which has been extracted from the various claims in the Black Hills or Lava Beds. A large quantity of rock has accumulated, which it is believed, will pay handsomely.

Pacific—Plymouth Cor. Amador *Ledger*, Jan. 7: In the 1000 level of the Pacific connection has been made with the old works from the Empire side, and in a few days rock will be hoisted. Men are now driving a tunnel at the 1100 level to strike the ledge. The mill will be ready to start as soon as the pipe is laid, and the tail-race completed. It is expected, unless some unforeseen difficulty arises, that all will be in running order in about 10 days.

Empire.—This mine is pegging away in its old path. No new developments have been made worth noting, except a small vein north of the north shaft, which it is hoped will turn out well. The mill is running 70 stamps. There is ore enough to keep the full 80 stamps going, but the belt pulleys of 10 stamps are considerably injured, the result of the late boiler explosion.

Seaton.—The new 20-stamp mill will be pounding out the precious metal in a couple of weeks. Rock is being taken out through the tunnel and placed on the dump. Rock from the Seaton paid well years ago. But few men are employed at present.

CALAVERAS.

Good Clean-up.—*Mountain Echo*, Jan. 10: Osborn & Co., the owners of the hydraulic on Smith's flat, made a clean-up after a run of 12 days, realizing therefrom $90 Only three men are employed on the mine.

Rhubarb Mine.—As a matter of mining news we would state that the Rhubarb mine, situated in Nassau valley, is now in full operation. The proprietor who has been to considerable expense to prepare the mine for work, has erected a 6-inch hurdy gurdy wheel, to which is attached a pump three-fourths of an inch in diameter, which, it is said by competent judges, will throw from 15 to 20 quarts of water per day. There is also a windlass attached to the wheel by suitable machinery, which will probably raise from 12 to 14lbs at a draft. This mine has been located for many years, and a vast amount of money has been expended in working it. The main shaft is 26 ft in length, by 2½ ft in width, and 47 inches in depth; it is well timbered to a depth of 14 inches, and has never yet yielded a color, but the venerable proprietor swears that he will live in hope if he dies in despair.

Douglas Flat.—Operations are again resumed in the Eureka; a larger pump has been put in the mine, and the water is being slowly pumped out. Work will commence in good earnest in a few days. The Old Judge mine is still in full blast, and the company is extracting more dirt than usual, and will in future clean up three times a week.

DEL NORTE.

Elk River Mine.—Del Norte *Record*, Jan. 7: The Elk river mine has closed down. The box factory will run for some time longer.

Condon.—Mr. Truett has stopped work on the Condon copper mine. Since the transfer of the mine to the present owners work has been done at several places. Below the tunnel and westward of a north and south line intersecting it, ore has been uncovered by stripping the surface. From the open cut drifts have been run westerly, northwesterly and northerly, two of which showed more or less ore. Above this open cut, further along on the lode, a little prospecting has brought to light ore of varying grades. The labor in the tunnel has been perhaps the least satisfactory, though we understand that Mr. Murray, the foreman, anticipates a gradual increase in the bulk of yellow ore, or copper sulphurets. This character of copper ore, we are informed, is usually a exponent of permanency, and that, therefore, should Mr. M.'s theory prove well founded, this one opening may establish the constant value of the mine. In addition to the production of some considerable ore, excellent fire clay has been discovered, and a little asbestos. Rumor says the company intend to erect smelting works in the spring.

EL DORADO.

More Mining Improvements.—*Mountain Democrat*, Jan. 7: J. E. Lyon, came down last Thursday from his mine at Pleasant valley, which is looking very fine, and upon which he will soon contract for putting up a mill, the machinery having been purchased. Prof. Tuck and son have contracted for a number of Huntington batteries to be put up on their Ora Fino mine, near Shingle Springs. An engine run by compressed air has been set up at the 600 level of the F. G. Q. Co.'s mine. It works to a charm.

Mill Property Burned.—Last Saturday night, at the St. Louis mine, about 5 miles above this city, the mill and hoisting works, one of the finest properties in the county, was destroyed by fire. Mr. Biveu, the manager, was absent in Amador county, where he received a dispatch announcing the calamity, and as speedily as possible came over to investigate the matter. He was expecting tidings that the water in the mine had been so far lowered as to have reached the Cornish pump, when the news of the fire reached him. The buildings were partially insured, but probably not to an amount sufficient to cover the losses.

INYO.

Death Valley.—Inyo *Independent*, Jan. 7: T. F. A. Connelly writes from Gold Mountain that he has been on an exploring expedition into Death Valley. Some relics of the parties who perished there 32 years ago were found, consisting of a pocket-knife, a wagon-spoke, some bolts and a wagon-tire. Mr. Connelly's party visited the lowest place in the valley, and found the weather quite warm, so much so that coats and vests were discarded, and the perspiration started freely, especially in walking.

Cerro Gordo.—Mr. Crapo, with 2 shifts of miners, is engaged in crosscutting the ledge in his big mine on Buena Vista hill, Cerro Gordo. The depth is 100 ft, and so far the developments are reported as extraordinary, as to good ore and a big ledge, though nothing more than expected by miners and others familiar with the property.

Ore.—Supt. Wingard yesterday sent to San Francisco some hundred and odd pounds of average ore taken from the new opening on the Green Monster mine, over in the Inyo foothills, from which is expected orders to further prosecute the work of development.

Watcoba.—Mr. W. L. Fuller, who has lately been do-

ing considerable work for New York parties on some of the mines in Waucoba district, which formerly belonged to Bierstadt, Major Egbert, Dr. White and others, was in town yesterday. Mr. F. is highly pleased with the properties, with the abundance of ore, wood and water, and says that the only convenience lacking is a road across the summit of the Inyos and from thence down to the mines. On the Summit mine a shaft has been sunk 25 ft, showing a ledge 4 ft wide and on the vein of 2 ft, which assays $125, $300 and $400 per ton. This is silver ore, free milling, and the ledge crops out for 600 ft, in a lime and slate formation. Some 10 tons of ore is on the dump. The Wyandotte is argentiferous galena, averaging 34 ounces per ton silver. It is opened by a tunnel 18 ft long, and shows 1½ feet of solid ore; there are 15 tons out on the dump. The Blanca, a silver ledge about the same as the Summit mine, has a shaft 22 ft in depth, showing ore which assays $60 and $124 per ton, with about 12 tons out. These locations are situated on the east side of the Inyo range, about 15 miles north of Beveridge, and 20 miles southwest from Deep Spring valley. Mr. Fuller is expecting orders to go on with work.

To Return.—Supt. Holt, of the Rex Montis, has made arrangements with the company to run the mill himself all through next season, and will be here in a few days to get things ready for an early start. He says: "In the spring work will be resumed in the big tunnel, with a strong hope of continuing it until the Rex Montis is reached—this is the intention at all events. The company has awaked from its lethargy to the necessities of the case." Among other items Mr. Holt adds the following concerning the company's Secretary, Mr D. H. Ward, who paid the mines here a visit some 2 years ago: "Ward is in China, having chartered 8 ships before his departure to load back with goods and coolies—not, however, for Rex Montis, but for other purposes—a contract in which he is connected of $9,000,000, and an agent is now East to increase the contract to a much larger amount."

Inyo.—The Supt. says: The mill has continued to run steadily since my last, with good results, and the ores running fully as high as I estimated. Including what I have already shipped for month of January, 1882, I expect it to be very near $40,000 for the month. Am now running through my low grade ore, reserving the rich for last of run. Our Eureka mine still continues to develop fine, with every prospect of making a large and extensive body of rich ore. At present I am milling ores from this mine which average $150 per ton. All of the other mines continue to look well at all points.

MARIPOSA.

Diltz Mine.—Mariposa *Gazette*, Jan. 7: The principal work at present upon this mine is driving a breastwork of dirt and rock, threaded with numerous stratas of quartz running at right angles from the main vein, the latter of which is left undisturbed. The breastwork alluded to will average 40 ft in depth by 100 ft in length. Giant powder is freely used to loosen up and cave the bank, from which is selected the paying ore and dirt, the refuse being thrown aside. The dirt and decomposed matter is loaded upon cars and taken to the flume, already prepared to wash, whenever there is sufficient water. There appears upon the face of the work at the present time, 30 strata veins of quartz varying in size from 1 inch to 3 ft. The casings of the stratas are rich in free gold, besides the solid quartz is considered good milling rock and is piled up for that purpose. Capt. Diltz is preparing to drive the work more extensively than has heretofore been done, by increasing his force and using more powder He starts for San Francisco to-day to lay in supplies and ammunition, with a view to prosecuting the work upon his mine with increased vigor. The Mariposa Quartz and Lumber Mills M. Co., represented by Mr. Wm. Shreve, have taken hold of this mine, and are erecting one of their rotary crushers or grinders, several of which are now in successful operation elsewhere. Mr. Shreve is confident of success in this enterprise, and that large profits will be realized therefrom, is the prevailing opinion of those best informed with the mine and the proposed method of working it. The mine is recorded and known as the "Reed Gold Bearing Talc Mine."

MONO.

Standard Con.—Bodie *Free Press*, Jan. 10: There were extracted and shipped to the mills during the past week 1310 tons of ore from the 300, 385, 500 and 550 levels. The average pulp assay for the week was $17.14. There was shipped to San Francisco $21,566 in bullion. The upraise on the Cook vein, 3-5 level, has been raised 14 ft; total length, 147 ft, showing a vein 4 ft wide. The different stopes look well and are yielding as usual.

Bodie Con.—During the past week there were 70 94 tons of ore sent to the mill, and 60 0 tons were extracted from the mine, as follows: 7.9 tons from the 5th inclins level, 62 tons from the 6th level and the workings below. The mill crushed 114.04 tons, of which the average assay value was $75.24 per ton. The average assay value of the tailings was $8.07. The bullion shipmont amounted to $7,080.34.

Union Con.—During the past week 12 ft were added to this length of the south drift on the Bonnsr vein. The rock has been firm, but several additional seams of clay and quartz have made their appearance. The ore lying next to the foot or west wall of the vein still continues the highest in grade. Its width has increased somewhat of late. The additional quartz making its appearance in the vein has divided the porphyry in the center of the vein, and considerably lessened its width. The average assay of the ore taken from the vein the past week has been: Gold. $27.53; silver, $11.05; total, $38.58. A drift north on the vein will be started next week, running north from the tunnel to the north boundary line.

Tioga.—Since last report some new developments have been made. From the 982 level the west crosscut No. 4, has been extended a distance of 90 ft; progress for the week being 21 ft. In the last report mention was made of quartz seams of value being cut. The entire distance run during the past week has been in a mixture of porphyry and quartz. The east crosscut No. 3 from the same level, is in 70 ft; progress 13 ft. There is no change to note since last report in connection with this portion of the work.

North Standard.—Supt. Harry Loryea reports as follows for the week ending Jan. 9th: During the past week the east crosscut has been advanced 0 ft. The formation passed through looks very encouraging. The north drift has been advanced 8 ft. The ledge in this drift is 4 ft wide. The drift on ledge No. 2 has been advanced 6 ft. The ledge is 3½ ft wide. The ore will assay $30.78 a ton. The stopes show an ore body 4½ ft wide and look as well as usual.

Noonday.—The usual quantity of ore is being extracted and milled from the 212, 322, 412 and 512 levels.

Con. Pacific.—The turntable is completed, and hoisting from the station goes on regularly.

Bodie Tunnel.—The upraise on ledge No. 20 made fine headway during the week The mill is being overhauled preparatory to receiving the stamps, which are en route from San Francisco.

Goodshaw.—Six ft, four inches were added to the depth of the shaft during the past week. The water has disappeared and everything is running smoothly.

NEVADA.

The Banner Mine.—*Transcript*, Jan. 7: The new steam pumping and hoisting works at the Banner mine, which were recently constructed at Lawrence & Barlow's foundry, have now been in successful operation for several days. The plant includes a 12-inch Corliss engine and very heavy machinery. The crown-wheel weighs 5,800 pounds, the fly-wheel 3 tons, and the other parts in proportion, making it one of the most powerful lots of machinery in the county. The building is 70x40 ft in dimensions. Operations are being carried on through an old incline 635 ft north, on the surface, from the deep workings of the former Banner company. The new owners are now down 280 ft, and propose to sink 420 ft further before drifting. At the 700-level it is believed the chute, which is pitching north, will be found within 40 ft of the incline, into which it will come by the time the 800 is reached. A depth of 700 ft on this inclins will open ground over 100 ft lower than the early workings reached. The incline is 5x10 ft in dimensions, has 2 compartments, and requires no timbering as the ground it passes through is very hard. It is now going down at the rate of 10 ft a week Supt J. E. Brown estimates that it will require a years' hard work to reach the required depth of 700 ft Six men are employed underground and 4 on the surface. James Donald, a first class practical miner of many years experience, is in charge of the work as foreman.

PLACER.

Big Ledge.—Placer *Herald*, Jan. 7: Mr. J. J. O'Sullivan is at present sinking on what is known as the Big Ledge, located on the ridge between Rich flat and the North Fork, a short distance south of Auburn, and he finds the rock as he goes down fully better than he had expected. The ledge is some 8 or 10 ft thick, and at a low rate per ton, could be made to pay handsomely.

Col. J. H. Brown, of Michigan Bluff, has got his new 5-stamp quartz mill, which he has been erecting in Bird's flat, near that town, completed and in operation. If the Colonel's ledge shall prove nearly as rich as the surface ground in that locality has been, then certainly he has his fortune.

SIERRA.

Work—*Mountain Messenger*, Jan. 7: Dr. Biber has just put several men to work at the St. Charles Hill mine, a few miles below Goodyear Bar.

Good Hope.—Half a dozen or more persons have filed liens against the Good Hope quartz property.

Snow.—It commenced to snow on the hills Tuesday night, and the prospects are good for a heavy fall. Five or 10 ft of snow would insure a good water season, as what snow there is, is full of water and the ground is warm and well soaked.

B. M. Ex. Co.—At the annual election of the Bald Mountain Extension Co., the following were elected directors: J. A. Vaughn, H. T. Briggs, S. B. Davidson, N. H. Meany and J. A. Blohm. H. T. Briggs, was chosen president, and J. W. Orear appointed Sec'y and Treas. The board of directors meets regularly on the 6th and 20th of each month.

SISKIYOU.

Another Cut.—Yreka *Journal*, Jan. 7: The Centennial Co. have commenced another cut. They have made a long and successful season. Their ground pays from top down. The Yreka M. Co., have a large force at work enlarging the capacity of their reservoir. The tunnel on the Empire quartz mine has just been completed, which will give drainage to the rich vein which paid so well on the upper level. Judge McConaughty has completed his ditches at French creek in Scott valley, for the purpose of working ground he has bonded, or rather leased for 25 years, with the new Plant amalgamating machine, lately patented, for saving the finest gold. The Judge prospected these mines with Senator Jones in 1857, while on a hunt in the mountains, Jones having come up from below on a hunting excursion. The Centennial Co. found richer pay than ever in bottoming up their cut, finished last week, but keep the result private, a rule adopted by the company, not being desirous of bragging.

TRINITY.

Trinity Center.—Cor. Trinity *Journal*, Jan. 7: The mines are about ready to run, and in good shape. Bloss & McClarey are putting in a new 6-ft flume, high enough to give them a good dump. When this is completed they will have one of the best rigged claims in the county.

NEVADA.

WASHOE DISTRICT.

Union Shaft.—*Enterprise*, Jan. 8: Are easing shaft timbers and repairing the drain tunnel on the 1600 level.

Utah.—Have finished up work on the bob pit at the 2250 level. The east drift on the 2500 level has been advanced 25 ft.

Mexican.—On the 2700 level the main south drift has been extended 20 ft. On the 2900 the joint Ophir east drift has been advanced 12 ft.

Con. Virginia.—Are still cleaning out and repairing the old drifts and winzes on the 1600 and 1700 levels connecting with the old Con. Virginia shaft.

Union Con.—Have resumed work in the joint Sierra Nevada east winze.

Caledonia.—Are still cleaning out and repairing drifts and winzes on the 1000 and 1700 levels connecting with the old Con. Virginia shaft.

Sierra Nevada.—On the 2500 level the winze in No. 2 crosscut has been sunk and timbered 6 ft; the station for the winze in crosscut No. 3 is now completed. Drill hole No. 5 has been extended 130 ft. The main north drift has been extended 30 ft, and the north drift 16 ft. On the 2700 level work in the joint Union Con. east winze has been resumed.

Ophir.—During the week 245 tons of ore have been extracted from the croppings, and 332 tons and 1,330 lbs. sent to the mills. Assays have not been received from the mills.

Alta.—The rock in the face of the east drift still continues very hard. Rock hoisted, 528 cars; wood burned, 75 cords; strokes made by pump, 59,800.

Yellow Jacket.—During the past week the east crosscut drift, 275 ft south of the shaft on the 2828 level, was advanced 24 ft; present length of same, 120 ft; ground porphyry and quartz, which gives low assays. On the 3000 level the east crossdrift from the switch is in 390 ft, having been extended 34 ft since last report. East crossdrift from face of south lateral was run 32 ft; whole length of same, 96 ft. Both of these drifts have passed through several quartz seams.

CANDELARIA DISTRICT.

Northern Belle.—*True Fissure*, Jan. 7: On account of the favorable prospect in the winze from the west drift on the fourth level sinking has been commenced in the main shaft. The principal work in the fourth level during the week has consisted of sinking the winze mentioned above and in running the crosscut from the upraise to connect with the winze from the third level. The winze below the fourth level is now down a distance of 25 ft, and the outlook is quite encouraging, showing 2 ft of ore which will average $80 to $90 per ton, some of the assays going as high as $400. The formation in the vicinity is also very promising. The daily yield of ore from the mine has been about 50 tons. Mill No. 2 is running steadily and doing the usual amount of work. Total bullion shipment for December, $79,040.31. Shipmeut on January account to January 4th, $4,469.02.

Mount Diablo.—The winze from the crosscut at the bottom of winze No. 1, on the third level, has reached a depth of 42 ft and shows ledge matter in the bottom. The intermediate, below the third, does not look as well as at the time of the last report, but the prospect is good for the ore to open. The east drift from winze No. 3 is in 80 ft and has small bunches of low grade ore in the face. The winze from the west drift on the second level is down 62 ft and shows a well defined vein of $45 ore. The east drift on this level does not look so well, but there is every reason to expect that the same ore body now showing in this direction on the third level will be struck by running ahead the drift.

Parkess.—The main frame of the building for the hoisting works is finished except the roof, which is delayed for the want of shingles. The engine and boiler are in place and being painted.

ESMERALDA DISTRICT.

Mines and Mills.—Esmeralda *Herald*, Jan. 7: Many men are scattered over the hills in this district doing assessment work and fixing the boundary monuments of their claims. Ball and Groth are still at work on the Centennial, and the ledge as they go down continues good. The pipes are laid to the Humboldt mill and the water is running into the tanks—one on the side of Table Mountain and the other at the mill. We learn that the last of the machinery is now at Hawthorne. In the Cortez the ore chute in the incline, to extend from the intersection drift to the drift 83 ft above, or the 150-ft drift from the upper tunnel level, is being rapidly constructed. This level is now full of very rich ore. Still running the main tunnel back to find the hanging wall of the ledge, which is expected to be encountered in the next 20 ft Work is being prosecuted all through the mine and developments are entirely satisfactory to the superintendent.

EUREKA DISTRICT.

Ore Reduction.—Eureka *Sentinel*, Jan 3: Mr R. Zeile, Assistant Supt., and W. J Stephens, foreman of the Eureka Con. reduction works, went to the Eureka tunnel yesterday, to examine the ore with a view to taking a contract to reduce it at the works where they are engaged. From the first and second-class dumps each, they took away a number of samples from which assays were made by Mr. David Lunbom, as follows: First grade, $267.56; and the second grade, $89.99 per ton. The chief purpose of their visit was to determine the per cent. of lead carried by the tunnel ores, which they were satisfied upon investigation; so that it is now fixed that these ores will not be shipped away to Salt Lake, but be reduced in Eureka This is gratifying all around. The Tunnel Co. lose nothing by the bargain, as when freight, handling and other expenses are considered, the cost of reduction in Salt Lake of ore shipped from Eureka is about the same as the cost of reduction here. The Eureka Con. makes its profit, and the work will give employment to a number of men in the camp who would otherwise be unemployed. It was the subject of general remark with reduction works at home we should have to ship ores away hundreds of miles to be reduced. It will be learned with gratification that the shipment of ore started and already at the E. & P. depot will be ordered back, and that the future destination of all Eureka Tunnel ores will be the Eureka Con. reduction works

SILVERADO DISTRICT.

Rich Ore.—Eureka *Sentinel*, Jan. 8: A piece of galena ore carrying considerable "black metal," taken from the Queen mine, Silverado district, was brought in yesterday, which is said to assay $2,500 per ton. This mine has been a good paying property, the owners of it having been able to erect out of the proceeds of their work steam hoisting works. Developments are going on all the time, which the mine pays for, and more. The main shaft is of size 6x8 ft and is down 215 ft. A drift is run off northerly from the shaft, from which a winze has been sunk 25 ft. on a vein of ore 2 ft thick, that runs clean across the shaft. This ore will work an average of $300 per ton, and the vein shows signs of permanence. About 2 years ago considerable ore was struck in this mine at a depth of 100 ft from the surface, and was followed by an incline, in which it seemed to finish. The discovery of a paying vein of ore at the present depth is hailed as a sign of a permanent paying property. The Queen mine has already produced over $100,000, and regular shipments to the Eureka furnace are again being inaugurated. The Queen is one of the many properties in this section that shows that mining pays—at least, in eastern Nevada.

SUMMIT SPRINGS DISTRICT.

New Discovery.—Cor. *Silver State*, Jan. 7: The new discovery of Smelser & Co. is about 12 miles from Stone House, on the C. P. R R., in a southerly direction from that place and on the east side of the range. The vein strikes north and dips to the west at an angle of about 50°, and crosses a low hill jutting out from the main range. The vein is about 50 ft wide on the surface, and all ore. I went down the incline shaft about 70 ft. It is sunk about the middle of the lead. The ore has improved with depth, and is much better at the bottom of the shaft than at the surface. All the rock taken from the shaft is strongly impregnated with ore, and Mr. Smith, the superintendent, has offered to pay all expenses incurred thus far for the ore on the dump. The ore is argentiferous gray copper, carrying considerable gold as well as silver. The company will start a level from the bottom of the incline and crosscut the vein, so as to find the wall and ascertain the exact width of the lode, and they do not want visitors until they have properly defined it. The ledge can be traced by croppings carrying ore, over 6,000 ft. Smelser's ranch is about a mile and a half south of the mine, and a large stream of water flows there. The range south is capped with limestone threaded with veins of galena, copper and silver, and covered with groves of juniper wood, and water is abundant. Mr. Smelser has made some expensive and permanent improvements at his place. He has built high dams and long levees which back the water on to a flat, forming a lake, from which he irrigates his extensive alfalfa and grain fields. From what I have seen I have come to the conclusion that Summit Springs will prove to be one of the most extensive mining localities in Nevada.

WILLOW CREEK DISTRICT.

Emma.—*Silver State*, Jan. 3: The Emma mine at Willow Creek, owned by A. H. Ruse, is producing some very fine-looking ore. It is opened by a tunnel to a depth of 60 ft, and the ore is quite different and much richer than it was at the surface. It is free milling ore, principally chloride, and is said to assay over $200 to the ton in silver, and $30 in gold.

ARIZONA.

Silver District.—Arizona *Sentinel*, Jan 7: Mr. A. Ragel received by last steamer a sample lot of mineral from his mine, the North Star, East Silver district. The ore is of high grade, and mostly milling. It is the same class of rock found in the Mandeville lode. Progress in the Silver Glance contract is a little slow at present, the boys having struck a stratum of very hard quartz. Foreman Walter Miller, of the Lost mine, was in town this week on a business visit. Mr. Miller reports everything flourishing at Silver district, and that the Lost and Black Rock mines are making a good showing. It is rumored that a contract is about to be let, to sink 250 ft on the Engineer mine. This property prospects well, and depth will place it at the head of the great ore producers of Silent. Reports from the Amelia, Poerman's district, are very encouraging, hoisting plenty of good ore from the main shaft, where the men are sinking night and day. The Castle Peak mine, near Antelope, is opening up in good shape. The shaft is now down 30 ft in good quartz, with a strong vein in sight. The rock carries gold, copper and silver, and runs exceedingly high in the former metal. Plenty of good copper glance is also being taken out. This promising property is owned by Chas. K. Lambie & Co.

Globe District.—*Chronicle*, Jan. 7: A gentleman who has inspected the Missouri mine, about 3 miles from the South Pioneer, says it is a large, well-defined contact ledge, over 12 ft in width, which can be traced upon the surface a long distance. At the bottom of the 40-ft shaft there shows a 2-ft vein of rich ore on one side of the ledge, about 12 inches on the other side, and a small streak of rich ore near the center, while the whole ledge matter carries mineral.

The Gen. Hooker.—The Gen. Hooker is located on Gold hill, within 1 mile of the Golden Eagle mine. A tunnel has been run 135 ft into the hill, cutting the lode 135 ft below its surface, cutting through vein matter of gold sulphurets and pyrites of copper, which will give an average assay in gold of about $20. The highest assay reached $55. The mine is in granite formation.

Old Dominion and Borva Copper Mines.—From examination made day before yesterday, we are able to state that work on both the Old Dominion and Borva copper mines is progressing rapidly and with favorable results. On the Old Dominion the tunnel is now 375 ft. The drift spoken of in our last notice, from the winze towards the main shaft, 65 ft in depth below the tunnel, now connects the two, and is in good ore the whole distance of 80 ft, increasing in quality every foot, the richest ore lying at the bottom of the drift. The exhibit shows an apparent solid cubic ore body commensurate with the workings. In the Borva the tunnel cutting the 12-ft shaft is now in 60 ft, with continuous ore from the shaft, a considerable quantity of the ore at the bottom of the tunnel beginning to resemble in appearance that of the rich ores of the Old Dominion. From the 110-ft shaft near the base of the hill the drift is now in 12 ft, and is being steadily pushed forward. Altogether both of these properties give promise of splendid results.

IDAHO.

Leesburg.—Idaho *Messenger*, Jan. 7: Mr. A. G. Clemour, Leesburg, has disposed of his interests in quartz mines in Leesburg mining district. The amount of money paid has not transpired, but is supposed to be a very handsome sum. We hope that the purchasers will put a force of men on their mines as soon as the weather will permit.

Mr. P. J. Kesley, Supt. of the Idaho G. M. Co. of Othonville, has resigned his position, and has been replaced by Mr. Chas. J. Barclay.

MONTANA.

Magna Charta.—*Inter-Mountain*, Jan. 4: Within the past few days the main shaft, upon which sinking has of late been very actively progressing, has attained a depth of 400 ft, and the station has been cut out. Yesterday a contract was let for the extension of the crosscut, and this morning work was begun. Both the north and south veins will be fully opened up. In the 300 level the middle vein is yielding fine ore and the levels on the north and south veins are also contributing liberally to the mills. The daily production of ore from the Magna Charta is about 40 tons.

Alice.—Everything is running smoothly at the Alice. The appearance of the ore body in the 700 level has undergone no change, the quartz being of good quality but very hard. In the upper workings of the mine the extraction of ore is proceeding as usual, the reserves still being immense.

Bell of Butte.—A very rich strike of ore is reported in the Bell of Butte. The ore body is said to be fully 8 ft wide, and still one of the walls has not been reached. Assays are high, as the ore shows a profusion of native and wire silver. The polite superintendent, Mr. Downs, is in excellent spirits over the new development, which he declares to be one of the most important ever made in the camp.

Stevens.—The Stevens is in much better shape than for some time past. In the east level of the west shaft, and in the west level of the middle shaft the drifts are being actively extended on good ore. A block of ore about 75 ft in length connects the workings from the two shafts.

Strike in the Legal Tender.—From Mr. Phil Saunders, agent of the Legal Tender Co., who arrived from Clancey yesterday, it is learned that one of the richest strikes ever recorded in the Territory has been made in the Legal Tender. In the main shaft, which follows the old vein in a vertical direction, a station was cut out at a depth of 188 ft, and no little surprise was occasioned when the workmen broke into a fine vein of ore, which appeared to their astonished gaze to be of fabulous richness. In all probability the ore body is but a continuation of that vein concerning the discovery of which about a month ago so much enthusiasm was expressed. The new ore body has a clear width of 12 inches, and seems to be almost solid horn silver. The strike was made on New Year's morning.

Butte District.—*Inter-Mountain*, Jan. 7: Mining operations actively and successfully continue in all parts of the Butte district, and those which are not now producing ore are being developed by vertical shafts from which cross-cuts will soon be extended to the ledges. On the Butte Original operations are confined to the sinking of the main shaft, which has now attained a depth of 320 ft. A considerable volume of water requires to be hoisted, but as the presence of a large supply of water is always a hopeful sign, and as the machinery employed is of sufficient capacity to raise all that comes into the shaft, no trouble is experienced. It is not likely that a cross-cut will be extended from the 300 station of the Butte Original, the intention being to sink the shaft 400 ft before any attempt is made to explore the ledge. At that depth some magnificent developments may by expected. On the Anaconda, cross-cutting from the bottom of the main shaft, which is 350 ft deep, continues with all possible energy, and the ledge is expected to be tapped within a short time. The Sheridan, which shows one of the richest ore bodies in the camp, is temperarily closed down on account of water, but will be started up again on the arrival of the pumping and hoisting machinery lately purchased, and which is now en route.

NEW MEXICO.

Smelter.—New Mexico *Mining News*, Jan 4: Los Cerrillos miners are complaining that the M. & R. Co. intended to fix their rates for smelting ore at unreasonable figures, and those of the mine owners who can afford to do so express the determination to wait until there is another smelter in the district and the charges are reduced by competition. If the complaints of the miners are well founded it is a stats of affairs very much to be regretted. The district is just at a point at which a little boost each as the M. & R. Co. can give it would make it boom, and anything like oppression will retard its progress very materially. It would appear that there will be enough work for the smelter to enable them to make money without asking heavy prices, in which case it will be to the interests of the owners of the works as well as the miners to be reasonable.

OREGON.

Water.—Jacksonville *Times*, Jan. 7: More rain is wanted at once. Sturgis & Co. of Jackass creek are still engaged in drifting with fair results. The water has run down again during the past week, and most of the miners are idle. Geo. Schumpf has sent a lot of fine ore from his ledge to San Francisco for assaying. Reed & Vickroy, of Forest creek, are running with reservoir heads and expect to make a good clean-up. DeLamater & Co. have their mines, on Coy flat, Josephine county, in running order, and are working night and day. Jacob Klippel and Frank Staab, of Poorman's creek, have everything in readiness and are about digging a new ditch.

Unfavorable.—Many miners fear that the present season will be an unfavorable one, owing to the lack of rain. There is time for a good run yet, however. Wimer & Simmons' locomotive lamp is at Crescent city, and as there is but little snow on the mountains, it is expected to arrive before long. Chas. Williams, of Pleasant creek called on us this week, from whom we learned that the miners of that district have plenty of water and are busy. Wm. Linville and Wm. Little have purchased a piece of ground on Poorman's creek, of L. Herling, we learn, and propose working it this winter. Thos. Carr and H. R. Boling, of Foots creek, were in town this week, from whom we learned that mining is again in *statu quo* there for lack of water, which is the case generally. The Cayote creek mines were sold last Saturday at Sheriff's sale, by virtue of an execution issued in favor of H. Kelly and against Ruhle *et al.* They were bid in by Capt. Kelly for $15,000. Another bid of $12,000 was made by D. H. Feathers in behalf of other parties.

Applegate.—Hansen & Berryman, of Applegate, are still engaged in drifting in the bank of the Applegate, near Kuhli & Bolt's store, and have struck another pay streak that promises better than the old ones. They often realize $15 a day to the hand, while washing the dirt.

Galice Creek.—F. B. Rodgers, who has been spending the holidays in the valley, returned to Galice creek Wednesday. He informs us that McElvey & Simmons' claim is being rigged up with plenty of hydraulic pipe and a "giant," which will be in operation in the course of a very few weeks.

Hogue Mt.—Skeeters & Co's mines on Hogue mountain, Josephine county, are promising very well. Recent prospecting denotes that they are rich, and of great extent. One box yielded nearly $4, after a very short run, and $1 worth of dust was realized from a single pan taken from the ground sluice. Sheriff Bybee is interested in this mine.

Bybee & Newman's claim near Waldo is paying very well, although they have not the requisite amount of water. They cleaned up their boxes after a short run, and realized $575. The ground sluice remains untouched, however, and there the best pay is supposed to exist. Mr. Bybee believes that a small ditch is all that is necessary to make it one of the best pieces of mining property in this section.

Science in the Public School System.

Schools of Art, Trade, and Commerce.

[Read before the California Academy of Sciences at the annual meeting, by Prof. George Davidson, U. S. Coast and Geodetic Survey.]

One of the subjects of deep interest that is now occupying those thoughtful men who realize the application of scientific results to practical industry, is the best means of incorporating the elements of this knowledge in the course of an ordinary education, so that it shall enter into and improve the character of our industrial products.

This idea has been quickened by a certain and formidable danger that threatens the higher manufacturing and mechanical industries of our country, in the great and commendable energy with which European nations are urging and extending their systems of special education; fitting the young to be better adepts in their several handicrafts; educating those who combine theoretical acuteness with practical application, to be foremen, masters and teachers; giving every reasonable assistance to the higher class of thought and aptitude.

It is no ordinary question of mere choice of routine; it comprehends the struggle for national supremacy in manufactures.

As our present system of public school instruction is utterly unprepared to meet the demands necessitated by such foreign competition, any change to remedy its defects must be vital and perhaps radical, and will meet with much illogical opposition.

We have always expressed the need of scientific methods in the higher and more thorough system of education, and certainly there must be a necessity for the introduction and application of such knowledge in all elementary education. Hence it seems to me that this Academy, both in its corporate and individual capacity, should not only maintain but express consistent views upon the subject.

One of the means of expressing the necessity for universal scientific education has been in the temporary establishment in different countries of the

Industrial Exhibitions

Of the manufactures and appliances of industry, and especially of those products which have mainly added to the wealth and prosperity of the nation.

Whilst this lacks depth and universality each exhibition has given impetus to individual efforts which have expanded and influenced the modes of production and the quality of the commodities.

It is deficient in generality because only a comparatively few persons can profit by consulting any special class of machinery or production. These few persons must already be fairly well skilled in order to judge of the relative merits of any process, because the time for examination is limited, and the opportunity for detailed instruction restricted and frequently forbidden.

Whilst these expensive national exhibitions have demonstrated their own inherent weakness as educational factors, they have suggested the better method of

"Beginning at the Beginning,"

And thence logically developing some system of education suited to the environment of each people and each country.

The very limited and tentative experimentation in Europe in the establishment of trade schools and art schools, has demonstrated their paramount necessity to the nation whose prosperity is mainly dependent upon the productions of handicraft.

Our acknowledged aptness and acuteness in invention has given us a certain position in the world-market of manufacture and trade, but we must yield to others the higher attribute of adding pleasure to the eye by combining beauty and gracefulness with usefulness. It is this combination which gives to France her superiority in the production of textile fabrics and works of art, and we unconsciously but assuredly help to support her factories and her schools of industrial teaching by purchasing at such high rates the output of her workshops.

England

Has already taken the alarm. Exhibition after exhibition confirmed the statement that in every department of manufacturing industry Continental Europe was abreast and even ahead of her in the make, style and finish of their goods. In the exhibition of 1851 no Englishman received a premium for design. Competition sharpened the inquiries of business men and manufacturers as to the cause. England's cruder products, made and fashioned almost by rule of thumb, were being supplanted by the more eye-satisfying products of Belgium, Switzerland, Germany, Austria and France. Her citizens, made rich through the great opportunities which her coal and iron had made possible, now begin to build and endow colleges for scientific and technological learning, even to the exclusion of classics.

Her far-seeing statesmen, her well-informed manufacturers and her scientific leaders have collectively given the warning, and are endeavoring to mold the educational system to meet the inevitable struggle for commercial and national supremacy.

Among ourselves, we unconsciously appreciate this situation, and tacitly acknowledge the

Need of Higher Finishing Skill,

By securing the services of technologists. In nearly all other countries, these specialists are native and to the manner born. In England this is partially so; but in the United States, we do not hesitate to scour other countries when we need some specially qualified workman. So true is this, that I know I am safe in saying, that within a very recent period, nine-tenths of the foremen in the workshops of this city were educated in the trade schools, or learned their deftness under a master of the trade in a foreign country; and certainly not more than one-tenth of the skilled workmen among our higher-grade industries have acquired their aptitude from home teaching and experience. I could enumerate many instances which have come within my professional ken and experience, but the enumeration would be invidious, as well as mortifying to our pride.

If, then, success is rapidly rewarding the

Systematic Teaching of Handicraft and Art

To the youth of other countries so that they control the best places in our workshops; if we acknowledge the superiority of many foreign productions, as is proved by the immense importations thereof; if we propose to increase our national prosperity, and acquire manufacturing, commercial and agricultural superiority; if we are met at the very threshold of our social fabric by the pertinent and penetrating question, "What shall we do with our boys?"—does it not strike you that we should learn more minutely what has been done at those industrial centers whence we call for skilled workmen, and whose workshop products are preferred to ours?—that we should profit by their experience?

The natural advantages are with the youth of America, as is shown by our inventive skill, by daring and successful engineering, by the restless mental activity of young life.

It would seem, therefore, that the youth of to day, who are to lead to-morrow,

Need a Different System

For guiding, developing and applying their faculties, from what now exists. This conclusion is fortified by the establishment of a limited number of special schools of technology in the Atlantic States, and the forced, tardy, and yet wholly insufficient introduction of science in the curriculum of some of our colleges. These advances have only made a start in the great centers of industry and population, and the public mind seems unfortunately to have accepted the long unchallenged assertion that a common school education is amply sufficient for the young American; and that his quickness and aptness will in some "royal way" fit him for any position he names. This is simply a monstrous mistake.

I earnestly believe in

Universal Education,

And in carrying it to its legitimate conclusions. It is a necessity of the age; it cannot be set aside if we would. But I believe in its being so construed that the blacksmith shall understand the character of the material and tools he is using; that he shall have skill to use neither too much nor too little metal; and that his productions shall have the best shape for strength and beauty combined. That the joiner shall know the peculiarities of the woods and tools he is working with, and that he shall be shall use them to the best advantage. That the weaver shall know how to produce the best goods for wear, as well as those wonderful creations of textile fabrics which are a marvel to the eye of taste. That the wood turner, the metal worker, the instrument maker, shall, by deftness of hand and accuracy of eye, more than rival the artisans of other countries.

The present school system has

Spoiled Tens of Thousands of Artisans;

But it has in a measure only repeated the experience of other countries. To state its results mildly, it may be said to create a disposition in the pupils to avoid those occupations which demand manual labor, and to seek those easy berths where somebody else does the work. It creates a false standard of manliness. It covers a multitude of incongruous subjects, and lacks completeness and thoroughness in any one of them.

To those who have the capacity and the support to follow its higher courses, it does offer a more apparent completeness and thoroughness. But I contend that from the standpoint of availability to meet the exigencies of daily life, from the standpoint of national superiority in manufactures, mining, commerce, engineering and agriculture, it is absolutely necessary that the system should be fitted to the needs and wants which the sharp competition for such supremacy demands. It is not the struggle of one man, or of one city, or of one State against a friendly neighbor; it is the battle of industrial life of 50,000,000 people—of 100,000,000 within a generation—against the experience and more readily molded compact populations of Europe, guided by keen manufacturers, special technologists, trained educators, and broad-viewed statesmen.

I do not deprecate the wisdom of our really great men in education, in statesmanship, in science, in manufactures—on the contrary, I hope to see their wishes and efforts come to fruition. You have but to consult the reports of our Commissioners to the Paris Exposition of 1878 to be satisfied of their thorough knowledge of the situation, and of the earnestness of their awakening call. If I were, however, to reproduce their criticisms you would pronounce them cynics; nevertheless they were the representatives men in education, in art, in manufactures; they were alive to the progress around them; they were lifted above provincialism to the higher plane of nationality. They gauged the active and the passive nations—the one colonizing the earth through ship, machine and free speech—the other enjoying the delicous listlessness of drifting down stream.

I may but refer to

What Other Countries are Doing

To afford such practical education to their youth as will give them pre-eminence in their different handicrafts.

France has her school workshops, which are established upon the proposition that whatever be the actual fixed calling of the youth, there is a certain number of leading subjects of education common to all, and to which the instruction intended for artisans should conform; and this course is combined with a continuance of regular school instruction, and perhaps it may not be imposing upon your patience to enumerate the subject matters included in

The General Programme

Of one of the most successful workshop schools in Paris.

1. The continuance of school instruction, somewhat modified from its present type; the maintenance of examinations which shall give the right to the certificate of primary education.

2. Study and management of raw materials.

3. Drawing from patterns in relief, modeling, molding, sculpture upon soft stone, marble and wood, graphic drawing and ink shadings.

4. The practice of general processes and tools; work at the bench, at the forge, at the lathe, at the vise; elementary specialization when the pupil has in view a particular industry.

5. General technical education and specialization of that part which bears on the chosen trade; book-keeping; industrial and commercial geography; first elements of economy.

6. Delineation with scale and dividers of a piece of finished work or a machine; working plan on a given scale; sketch or free-hand drawing; reciprocally, execution after a working plan on a given scale, or after a rough draught.

7. Invention, plotting, execution of simple plans.

8. Morals, duties of men, the child, the laboring man, the man of property, men in mutual relations, the head of a family, the citizen, and the country.

9. Habits, personal order, order in tools, order in labor, order in the shop, order in accounts, order in thought, spirit, and hence in conduct.

Upon this basis are planned the different workshops for different trades; the allotment of practice and study; and all the minutia of detail which a systematic organization demands.

Combined with this system are the

Journeys of Instruction,

Which embrace the visiting of workshops, collections and works of construction, upon which reports are made by the pupil visitors. In these journeys a specified number of pupils are selected from certain schools on account of their diligence and proficiency, to visit the great centers of industry—extending even to adjacent countries. The details of all such excursions made out as reports by the pupils, are exceedingly interesting and instructive.

There are numerous technological schools throughout the republic; a national school of Horology at Cluses, and commercial schools and schools of navigation at Havre, Marseilles and other cities.

Moreover, the adult population is not forgotten; and besides the encouragement given to public adult instruction, there are special free schools for adults, particularly for the teaching of drawing, and evening schools to meet the cases of those who appreciate the need, and now first find the opportunity for education.

The results of

These Different Classes of Schools

Has been remarkably instructive and encouraging, and will gradually lead to a thorough and more homogeneous system throughout the country. At present, the plan of education is but emerging from the control of the clerical party, and coming in contact with the realities of active business life.

In Russia,

The great technological schools of Moscow and St. Petersburg have shown their capacity and their influence, and the workmanship of the pupils created astonishment and admiration among our instructors and mechanicians who examined their exhibits. They rival our best efforts.

In Germany,

In Austria-Hungary, in Switzerland, the Netherlands, Belgium, and other countries, we find that the trade and art schools are gradually but assuredly raising the character of the artisans' work, and necessarily adding to the mercantile value of their productions.

England

Has awakened to the necessity for a better and more adaptable education to her artisan classes, and for a more cultivated taste and execution among her skilled workmen. For years she rightly considered herself at the head and front of manufactures, but little by little the truth dawned upon the minds and pockets of her manufacturers that the progress of foreign workmanship could not be attributed altogether to the greater industry and lower wages of the workmen, but that the cultivated intelligence derived from attendance and study at trade and workshop schools, and technological institutions was the secret of successful competition. Those immediately interested saw that the same character of education must be imparted to the British workman; but in a country so conservative of old customs the greatest tact was necessary to introduce new methods.

But that most sensitive of all nerves, the pocket nerve, has quickened the commercial and manufacturing instinct, and to-day the mystery has become a conviction.

The first outcome was the establishment of the

Leeds Textile School,

Founded by the munificence of the Clothworkers' Company of London, but owing its existence to the pressure of the Leeds manufacturers. Then followed the Glasgow Technological school, profiting in its organization by the experience of the Leeds school. Later, the example was enthusiastically adopted by Bradford; and elsewhere the idea has germinated, and classes and schools have been formed. In no direction is there any indication of aught but success; the advantages of these schools are earnestly and even enthusiastically embraced by workmen.

And so might the story be continued. I have only made the matter suggestive for action.

But I cannot refrain from quoting the warning of others. The

U. S. Commissioner of Education to Paris In 1878, says:

"We are behind Europe in the education of the powers of observation and manipulation. The sharp competition of the different countries of Europe demand the cultivation of the eye and the hand, and long practice has given an aptitude and ability transmitted perhaps as an inheritance, and so become a second nature. But we certainly need to do a great deal more in this direction, and we cannot begin it too soon. If the brain of man conceives the strategy by which we master nature, it is by the eye and the hand that the real victory is to be achieved. A large amount of the educational effort of this country is directed to sharpen the wits and quicken the inventive genius of our people, but our lack in bodily training will before long make itself painfully evident."

Of course we have not forgotten the existence of the few higher

Technological Institutions of the United States,

Nor their high rank and efficiency, but my especial object has been to insist that in our ordinary public schools we have not professed to reach that point of necessary useful knowledge, much less its application, which our status as a manufacturing and commercial nation demands.

You will ask how our youth are to receive that instruction which shall fit them for successful competition in the struggle for national superiority in manufactures and commerce.

The answer cannot be given impromptu; we must, to a certain extent, be guided by the experience of other countries, and must comprehend their political and social organizations for comparison with our own, to understand what we shall adopt and what modify. All their systems of trade, workshop, and commercial schools have grown up with local constrictions, and yet have a national object in view. They had many serious obstacles to overcome, perhaps more than we have, for they had less freedom of personal action and thought. We have more of individual independence, which may aid in developing special schools for trade and art, more particularly in those centers demanding them.

Nevertheless, whatever be the ultimate character of our common education, there are certain

Fundamental Branches of Knowledge Underlying all Trades

And productions. These come under the general designation of science; and the elementary laws thereof, and their practical application to the manufactures, agriculture and mining of this country are not beyond the scope of our present public school system; nor beyond the readily assimilative power of our pupils. Whoever has come into contact with our youth will fully bear me out in that conclusion. And whoever has had a varied experience with young men, grown up from the ordinary public schools, will be astonished at their lack of knowledge of the fundamental principles which underlie their workmanship. They have in general an amount of undigested and incoherent material which their teachers have christened knowledge, and which their inexperience considers applicable for any and every pursuit. For example, one of the commonest wants of pupils throughout the country is their inability to draw upon paper any plan of roads with which they are familiar, any sketch of the plainest machine of every day use, much less to convey any idea which looks to an improvement or an invention in machinery or construction. I feel perfectly safe in saying, from my experience, that not one person in a hundred from our public schools can give you an off-hand drawing of any plain object, with any approachable degree of accuracy as to relative dimensions or perspective.

This is not the fault of the pupils who, as a rule, are naturally quicker and brighter than the youth of Europe; but it is the inherent weakness of the system, and a painful evidence that we are not doing our duty to our boys.

Again, you ask,

Can these Deficiencies be Corrected in our Present System?

I answer, yes; in a measure. Time is required to mold and develop the proper system of trade and art schools, of evening and navigation schools suitable for this side of the continent at least; and pending this, we can certainly engraft upon our methods the proper study of elementary sciences, and especially connect

therswith the free hand drawing which is the *sine qua non* in every school of the active nations of Europe. Our youth who are to build up the industrial supremacy of this country need not be crammed with foreign languages, which in a few years must be pressed aside before the irresistible progress of the English-speaking races; and it is a thousand times better that the boy who is to honestly earn his livelihood as an artisan, shall be a fair draughtsman than a fair fiddler. If his special talents point to music, then let that faculty be thoroughly cultivated; but do not waste means in spoiling a good carpenter, or in endeavoring to misdirect special aptitude. The classics, music, and the fine arts have their high places and their humanizing functions in modern civilization. So has the bridge-builder, the miner, the engineer and the contractor.

Life is too short for us to repair the errors of early education; the State loses by the misapplication of talent. We need not wilfully throw our wealth into the depths of the Pacific.

There are many

Important Conditions Attached to this Subject

Of science-teaching, and of trade and art schools, especially when we contemplate how extensively great corporate bodies are gathering into their hands the manufacturing processes of the country, and apparently swallowing up individual efforts; but each year the demand for skilled labor increases, and we must meet the difficulties of the problem as the number of factors is increased. We may never see very far ahead into the unknown—we should never be one step behind the requirements of the present.

I cannot, however, enter upon the consideration of the many actual and speculative phases involved and which are intensely interesting. I have simply endeavored to do a part of my duty as a citizen, and as a member of this Academy, in calling attention to the absolute necessity which exists for properly educating and fitting our youth for the duties which will be demanded of them in the struggle for national supremacy in material wealth.

A New Furnace.

The Santa Catarina Copper Co. is a corporation recently organized among the strong capitalists of New York and Boston by Dr. S. K. Kane, who purchased a group of copper mines in the Santa Catarina mountains, Old Hat district, which are said to equal the best mines yet discovered in the Territory, both in the quantity of the ore and its percentage of metal. Three thousand tons of ore is now in sight and on the dump ready for the furnace, that will give over 25% in copper, besides considerable silver. Enough has been developed to warrant the erection of a furnace, and the Superintendent, Mr. Walter B. Scott, formerly with the Huachuca M. and M. Co., is now in San Francisco selecting furnaces and the necessary machinery to work the mine and reduce the ore.

The furnaces will be erected at the mines, where a good supply of water has been obtained and plenty of wood secured to supply the furnaces for years to come.

From the mines to the San Pedro river, 15 miles, the work of constructing a road has commenced. Ninety men are now engaged in the work, and 50 additional men started this morning to build the road. When the San Pedro is reached the company have not yet decided whether to ascend the river to Benson or build a road down the stream eight miles to connect with the existing road to Tucson. In determining this question, much will depend upon the encouragement given by the business men of this city in securing an improvement in the condition of the road. Benson is the nearer railroad station of the two, yet Tucson possesses other advantages. A little exertion and united action by the business men of the city can secure for Tucson the benefits arising from the very large business of this company and of others which will soon begin operations in that vicinity.

It is expected that the furnace will begin its work of smelting in less than two months, and from the capacity of the mine and the quality of ore, a steady stream of bullion may be expected to flow and monthly dividends follow with gratifying regularity.—*Arizona Miner.*

History of a Mill.—Most of the early residents of this part of the State will remember the old Metropolitan mill, formely located at Shermantown, White Pine county, in which, during the early excitement of that district, a large portion of the rich ore taken from the Eberhardt mine was worked. This was during the years 1868 and 1869. Some time in 1871 or 1872 this mill was taken down and removed to Eureka, and called the Lemmon mill. It has been here ever since, and it should be said, for the sake of accuracy, that the mill was not new at Shermantown. It had been transplanted there from Hot Creek, whither it will now return. This completes the circle. The mills of the gods grind slow—there are other mills that grind fast—and there are still other mills that don't grind at all. The Lemmon mill may be capable of some good grinding yet; but, if so, it will probably need plenty of time as the mills of the gods.—*Eureka Sentinel.*

The San Francisco Mining and Scientific Press, in its issue of the 17th inst., contains cuts of several points in Arizona, and a vast amount of information relative to our Territory.—*Arizona Gazette.*

Useful Information.

A Station Indicator.—Many inventions have been devised to announce to passengers the successive stations on a railroad by some simple act of the engineer or conductor, but hitherto with very little success. It is now, however, stated, on what appears to be very good authority, that practical success has been reached in this direction. This new indicator is the invention of Mr. E. S. Boynton, and is made by the Wheeler & Wilson Sewing Machine Co., of Bridgeport, Conn. At each end of the car is an oblong box containing the names of all the stations on a ribbon. Over the top of the box is printed "next stop," and the name of the station at which the next stop is to be made shows through an opening in the door of the box. The shifting of the names is controlled by the engineer on the locomotive. There is a small rubber bellows on each box which is contracted when the engineer makes a vacuum; this works a lever that raises a platform on which the band containing the names of the stations rests. An ingenious catch prevents the hand from slipping backward, so when the platform falls again by the bellows filling with air, the hand must fall to the front, thus shifting the name of the station passed to the next one above it. The engineer has a small indicator in the locomotive cab, bearing the names of the stations, and he thus knows whether the apparatus is set right. The indicator can also be worked by the Westinghouse automatic brake cylinders, or by a bell cord. The device does away with the train hands calling the names of the stations, and the names being printed in legible letters are more easily made out—by a person who can read—than some of the almost unintelligible ejaculations of a brakeman. The cost of the apparatus is about 1% of the cost of the car, and the inventor says the cost of maintenance will be very small.

Reversing the Wheels. — Experiments lately made at Blackburn with a train made up in imitation of that of the express which ran into the train standing in Blackburn station, to test the statement of the driver that he reversed his engine as soon as he found the brakes did not check his train, are of some interest, though they elicited the fact that the reversal of the engine of a train running at a high velocity has but a very small effect in reducing the speed. A high speed was attained, and the engine was reversed a quarter of a mile before reaching the station, but the train ran through the station at about 20 miles an hour, and had to be stopped by the brakes. Locomotive driving wheels, when running the reverse way, are not effective in stopping a train. The experiment shows how little can be gained by reversing an engine under such circumstances.

Bullet Making.—The manufacture of bullets is not so simple as it used to be. At Woolwich, the melted metal is poured into a receiver, and as soon as it solidifies, but before it is cold, it is forced by hydraulic pressure through cylindrical holes in the form of long strings. This process is to prevent the formation of air bubbles in the bullet, which would cause it, when fired, to swerve from its course. The leaden strings are thence carried to the bullet-molding department, where they are cut into lengths and rounded, then shaped in one machine and finished in another. They were formerly plugged with wood, but now plugs are prepared from a special powder, which solidifies after being pressed into form. For sharpshooting, great care is observed to obtain bullets of uniform size, shape and weight, and to use powder of a known explosive force.

To remove caustic stains—or such as will not yield to ordinary appliances—1st, take of chloride of mercury two drams; hydrochloric acid, two drams; dissolve. This must be applied to the stain with a camel's-hair pencil, and the linen, paper, etc., immediately plunged into water, when the stain will be removed. 1st it be afterwards dried in the sun. 2d, if a small piece of the iodide of potassium is rubbed on the part (which must be previously wet), it will immediately decompose the blackened oxide and convert it into the iodide of silver, which is soluble in water, and consequently may be discharged by washing. The above process will answer equally as well for linen, muslin, etc. Hot water dissolves the iodide much quicker than cold.

Cold Storage.—The increasing use of cold storage for perishable food stuffs, which are apt to be scarce at certain seasons, is one of the characteristics of the time. Last summer, when fresh eggs were plentiful and cheap, a gentleman in Chenango county, N. Y., stored in a mammoth cooler some 5,000 barrels of eggs. Now they sell in New York as "fresh laid" eggs, at a large profit. As the eggs are removed, the cooler is filled up with ducks and other fowls to be sold next spring.

Recovering Soap from Soapsuds.—At Ivry-sur-Seine, a manufactory of toilet soaps has prospered for a considerable time. The soap, which is perfumed with oil of roses, is obtained from the treatment of washing water in Paris, which, instead of being run into the sewers, is now collected in casks.—*Druggists and Chemists' Circular.*

The Action of Solder.—A correspondent of the *Scientific American* asks: "Why does solder melt under the soldering 'iron,' when it will not under real iron, and why is it necessary to have the tool coated with tin? Does it act as a flux?" The reply is given as follows: "Solder will melt under any hot iron, but unless the iron (or other metal) is perfectly free from oxide, perfect contact between the melted solders and the 'iron,' which is essential, cannot occur. When properly cleaned and coated with tin (or solder) the coating prevents re-oxidation of the metal while heating, and the fluid metal follows and can be directed by the tool.

A New Source for Glucose.—A company has been formed in Philadelphia to manufacture glucose from cassava, the plant from which tapioca is derived. Taking the average yield of corn—from which glucose is now made—at 35 bushels to the acre, the glucose product is only about 1,000 lbs. to the acre, while the average product from cassava, which yields 10 tons to the acre, would give a return of more than 5 tons of glucose. It is said that sometimes fully 20 tons of cassava is obtained from an acre of ground in Florida, which would double the above named yield, or give the large amount of 10 tons to the acre.

For Microscopists.—To produce animalcules for microscopic examination and study the *Scientific American* suggests the following process: Mix wheat flour into thin paste with a little yeast and cabbage water, and let it stand in a warm place until it becomes quite putrid. Mix this with water (or a little common vinegar) and examine. The time required to prepare such a paste under favorable conditions need not exceed three days.

To Clean Marble.—Mix one quarter of a pound of soft soap with the same of pounded whiting, one ounce of soda and a piece of stone blue the size of a walnut; boil these together for 15 minutes, and then, while hot, rub it over the marble with a piece of flannel, and leave it on for 24 hours; then wash it off with clean water, and polish the marble with a piece of coarse flannel, or, what is better, a piece of an old hat.

Good Health.

The Tape Worm.

Most readers know that the domestic pig is subject to a disease known as "measles," in which the muscles are more or less filled with *cysts*, which render the pork unfit for food; but I think few are acquainted with its cause.

Man, it is well known, is occasionally infested by a parasite—the so-called "tape-worm" (*Tænia solium*)—which may be described as having a tape-like body of varying length, with a differentiated "head" or *scolex* at one extremity.

This apparently single animal is in reality a colony of mothers and daughters, the scolex being the parent of all.

This "head" is provided with a *rostellum*, or, as it might be called, proboscis, encircled by a crown of hoods, below which are the suckers; each segment added to the scolex is a complete individual containing a complicated and perfect reproductive system.

The last segment—*proglottides*—which are filled with eggs, break off at intervals, and either the eggs are set free within the intestines of their host, when they are passed out with the fæces, or the segments themselves are evacuated.

The tape worm feeds on the juices of the bowel by absorbing the nutriment through its skin, and does not appear to seriously inconvenience its host in any way. In Abyssinia *tænia helminthosis* is constant and general; indeed the animal is there regarded as a sort of hygienic agent and cultivated rather than discouraged, yet the people are healthy; certain it is also that wild animals, almost without exception, harbor at least one species of tape worm as a natural condition.

But what has this to do with "measles?" Now to the point. Let us suppose one of the before-mentioned eggs taken into the stomach of a pig, either by its eating the excrement of a person affected or through the water or air; here it hatches, not into a tape-worm, but into an animal of oval form, transparent, contractile, in the middle of which are six stylets arranged in pairs; with these it cuts its way through the tissues until the muscles are reached, when, having arrived at its destination, it stops burrowing and surrounds itself with a sheath.

Here the stylets atrophy, a new and quite different crown of hooks is produced, and the parasite becomes a *cysticercus* or vesicular worm, the cyst being about the size of a hazel nut. This constitutes "measles;" the exhaustion or even death attendant on the disease is caused by the scores, hundreds, or even thousands of animals boring through the tissues; once encysted there is no further suffering or danger.

The cysticercus remains encysted for months or years, or until the piece of flesh enveloping it *is introduced into the stomach of man*, in which case it instantly quits its torpid condition, leaves its sheath, makes its way to the intestine, where, attaching itself by its suckers and hooks, it grows—or rather reproduces—so rapidly that in a few weeks a tape worm of several yards in length is formed, which reproduces eggs, and so *ad infinitum*—from pig to man, from man to pig.

Should the eggs be introduced into man himself or animal other than the hog, the cysticercus penetrates the tissues in the same manner, but it is "not at home," and instead of resting in the muscles it makes its way to other organs, such as the brain, heart, or eye, where its presence has caused in man several instances of insanity and death. Should a piece of meat containing a vesicular worm be eaten by a pig or animal other than man a *tænia* is developed, but it also is "not at home," and does not attain its full development.

Both eggs and cysticerci are killed by a temperature of 200° Fah., so there is no danger in eating well-cooked pork, even if it contains cysticerci.

To prevent hogs contracting "measles" it is only necessary to prevent them having access, either through their food or water, to the secretions of man, and they will not suffer.

Throughout the genus *Tænia* we find this duel life; for instance, the cat has a tape worm, the cysticercus of which she gets from the mouse, and the dog one which he obtains from the sheep.—*Scientific American.*

Sex Development in Nature.

The sentimental pretensions put forward by a political school which holds that woman is intellectually the equal of man, give a character of actuality to the question of the comparison of the sexes. This question, which it has been the custom to treat from a metaphysical point of view, is to us purely anthropological, or rather zoological; for we propose to show by characteristic examples borrowed from the whole animal kingdom that sexuality undergoes the same evolution in all species, including the human species. The female surpasses the male in certain inferior species. The males are smaller than the females among many cephalopods, and among some cirripeds. With a few exceptions the superiority of the females prevails among the annelids, and among certain articulates, as bees, hornets, wasps; and female butterflies are larger and heavier than males, a difference being observable even among the larvæ. A like superiority of females may be observed in many fishes, as in the cyprinoids, and in reptiles. This is, however, no longer the case among the superior vertebrates. The males of birds and mammals are nearly always superior to the females.

To sum up, the two sexes, at first unequal in consequence of the superiority of the female over the male characterizing the lowest species, become equal among species a little more elevated in the animal scale, and become unequal again in consequence of the pre-eminence of the male over the female, which is observed in all the higher species. The supremacy of the female is, then, the first term of the evolution which sexuality undergoes, while the supremacy of the male is the last term.—*Popular Science Monthly.*

People Who Whine.

There is a class of persons in this world, by no means small, whose prominent peculiarity is whining. They whine because they are poor, or if rich because they have no health to enjoy their riches; they whine because they have no luck, and other's prosperity exceeds theirs; they whine because some friends have died and they are living; they whine because they have aches and pains, and they have aches and pains because they whine; they whine, no one can tell why. Now, a word to these whining persons: First, stop whining—it is of no use complaining, fretting, fault-finding and whining. Why, you are the most deluded set of creatures that ever lived! Do you know that it is a well-settled principle of physiology and common sense that these habits are more exhausting to nervous vitality than almost any other violation of physiological law? And do you know that life is pretty much as you make it? You can make it bright and sunshiny, or you can make it dark and shadowy. This life is meant only to discipline us—to fit us for a higher and purer state of being. Then stop whining and fretting, and go on your way rejoicing.

Salt in Diphtheria.—In a paper read at the Medical Society of Victoria, Australia, Dr. Day stated that, having for many years regarded diphtheria, in its early stage, as a purely local affection, characterized by a marked tendency to take on putrefactive decomposition, he has trusted most to the free and constant application of antiseptics, and, when their employment has been adopted from the first, and been combined with judicious alimentation, he has seldom seen blood poisoning ensue. In consequence of the great power which salt possesses in preventing the putrefactive decomposition of meat and other organic matter, Dr. Day has often prescribed for diphtheritic patients living far away from medical aid, the frequent use of a gargle composed of a tablespoonful or more of salt dissolved in a tumbler of water, giving children who cannot gargle a teaspoonful or two to drink occasionally. Adults to use the gargle as a prophylactic or preventive, three or four times a day.

It is now thought probable that Iroquois and Foxhall will try conclusions in the spring over the Newmarket course, Eng.

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Passing Events.

In this issue of the PRESS we give considerable space to the subject of technical education, publishing the very full address of the President of the Academy of Sciences, and also an abstract of Mr. Jno. Richards' lecture, both kindred subjects. We are glad to note the interest which is awakening in this direction, feeling sure that it will beer fruit before long.

The weather for the past few days has been clear, cold and dry—just the opposite of what we want at this season. Even up in Oregon they complain of lack of water.

The Gold Run suit still continues, testimony being taken daily. We give in another column an abstract of the most important testimony elicited recently.

A glance over the mining situation on the coast shows it to be more highly prosperous elsewhere than in California. This, however, is due entirely to the litigation on the debris question. When this shall be definately settled we cannot, of course, say. The Government is moving in the matter, however, and there will be a solution before long.

ANOTHER EASTERN "PROCESS."—The New York *Sun* of the 1st inst., in a long and amusing article on the debris question in this State, apprehends that "the business of extracting gold by hydraulic pressure, which is now prosecuted on a vast scale, might result in serious injury to the farming lands and natural waterways of the State." This new process of "extracting gold by hydranlic pressure" should not be confounded with the lead-bath process about which the Eastern papers were lately so enthusiastic; for, after carefully studying the minute description given of it by the *Sun*, it becomes almost certain that something analogous to the piping system is meant.

Drift Mining.

Prospecting.

Surface indications of the presence of an old channel are not always to be found. Many of the best drift mines at present worked, and nearly all of those now worked out and abandoned, were found by following the surface placers in the ravines and on the hillsides, up to what may be termed the line of disappearance of river-washed gravels and gold. This line is the line of separation of the country rock and the overlaying lava or cement, and is often a seam of this same river gravel of varying thickness. Where this seam of gravel is of considerable thickness (and in hydranlic mines it often forms banks 200 or 300 ft. deep), it is usually a channel entrance; that is, the place where a buried channel crossing the divide comes to the surface and is broken off and washed away by erosion. Sometimes a depression in the line or upper edge of the country rock still further indicates the presence of an entrance, but this is not general or to be relied on. It often happens that indications can be found on the opposite side of the ravine or canyon of an entrance, and continuation of the same channel. Not considering the deep and extensive banks of gravel which are more particularly the province of hydraulic mining, those comparatively thin seams of gravel, deeply covered by cement and lava, are peculiar to drift mines.

These Gravel Seams

Are not of necessity confined to a definite channel, as the old streems left or overflowed their beds, carrying drift gravels and sands wherever their waters washed. They nearly always contain gold, but rarely enough to pay for the working, except in a channel or at a channel entrance, where they are generally extremely rich.

Where a channel runs parallel to and within a divide, no entrances or signs of entrances can be found. In such instances they are either discovered by accident in working other channels, or their existence first guessed at, and tunnels or shafts made, exploring their supposed location. The pitch of the bedrock is some guidance, but is not necessarily conclusive, as will be further explained. A channel is often found in one mine by aid of data from its occurrence in an adjoining mine; the course of the channel, its grade, width, and character of the gravel being the principal factors employed.

The possible

Location of a Channel Being Determined.

Exploration, to ascertain whether or not it contains pay gravel, and the location and quantity of it, is made, either by tunneling or by a shaft. If what is supposed to be the entrance to a channel is found, a tunnel is commenced some distence below the seam of rim gravel, as it is termed, and run on a light, natural drainage grade, either till it comes into gravel or is supposed to be beyond the rim rock, at which point an upraise or winze is made to the surface of the bedrock and overlying gravel. This upraise is usually at right angles to the line of the tunnel, and inclined at considerable pitch. From it, drifts are run on the bedrock in several directions, and gravel taken out and prospected. The course, width and grade of the channel are determined as near as can be from the little work done.

The So-called Rim Rock

Is a peculiar feature of all the fragmentary buried river beds. If the surface of the bedrock he followed inward at the entrance to a channel, it will be found to rise for some distance, and then to descend till the bed of the channel, in its undisturbed position, is reached, thus forming a natural rock wall across the bed of the old stream. This wall or rim must of necessity have been formed subsequent to the covering up of the channel with lava and the diversion of its waters, and was, in all probability, coincident with the erosion of the present streams.

The inciting cause was doubtless the swelling and expansion of the bedrock, relieved of the weight of the greater portion of the gravel and cement overlying by erosion, and assisted by atmospheric influences. Many of the prevailing country rocks, principally various forms and kinds of metamorphic slate, have great tendency to swell and rise. In some of the drift mines, considerable difficulty is experienced in keeping tunnels and drifts open, owing to this swelling of the rock. Not only is there a rim to the channels, but the bedrock of almost every lava-capped mountain shows the same peculiarity, in greater or less degree, the surface sloping inward from every side. The effect of these rims is to give the sections of old channels a basin-like form, this peculiarity being so marked and general, that the miners of a quarter of a century since, and before the advancement of the channel theory, prospected for "basins," not channels. Single mountains containing a fragment of a buried channel have been worked, and the rim found to extend entirely around, with no opening; thus forming a quite regular and perfect natural basin.

Tunnel Running

Is quite expensive, and where the depth of cement and gravel is not supposed to exceed 150 ft., a vertical prospect shaft is often sunk. Such a shaft can be made circular and only large enough for one man to work at a time, requires little or no timbering, needs no hoisting machinery but a windlass, and costs, according to the hardness of the cement and gravel, from $2.50 to $12 per foot. Drifts are run from the bottom of this shaft on the bedrock, and the necessary facts regarding the gravel and channel determined. Prospecting by shaft has the advantage of comparative cheapness, exploring much more ground with the same expenditure and in less time, but is uncertain in that the influx of water may be so great as to be beyond control, thus preventing the bedrock being reached.

In Prospecting for a Channel,

The location of which is suppositious, a shaft is generally preferred, as several may have to be sunk before it is found or the work abandoned. The cost of one or more tunnels exploring the same ground would usually be much greater. Shafts sunk for this purpose are constructed somewhat more thoroughly, and usually provided with hoisting and pumping machinery.

Permanent Working.

A drift mine is invariably worked through a tunnel wherever practicable, and the proper location and construction of this tunnel is of the first importance. On it often depends success in the working of the mine. The previous prospecting should furnish the necessary data for running this tunnel correctly. The entrance is usually in one of the small ravines cutting into the divide or mountain, two advantages being thus secured; the tunnel is made as short as possible, and the most favorable natural facilities for washing are obtained. The tunnel should be entirely in the bedrock, and its first direction so as to bring it under the nearest point of the channel; from thence it is run in the line of the channel as rapidly as developments are made indicating the course. To keep the tunnel in the bedrock, its entrance must be much lower than the channel bed. How much lower, is dependent on the grade of the channel and its flow, as regards the direction of the tunnel, the grade of the tunnel, and the length of the ground it is intended to work. All of these factors, excepting, of course, the grade of the tunnel, are at the commencement of the work only approximately determined. It is better to have the tunnel much too low than a little too high, so a very liberal allowance is usually made to cover possible errors of calculation from uncertain information. If the first tunnel is too high, it often necessitates the running of a second and even a third tunnel lower down.

The usual dimensions of this main tunnel are: Height, 6½ ft. clear; width, where untimbered, 5½ ft. at the bottom, narrowing and arching at the top; if timbered, it is between timbers at the bottom 5½ ft., and at the top 3 or 3½ ft. Variations from these dimensions occur, but they are, nevertheless, the most general that can be given.

The tunnel is run into the mountain on an ascending grade so as to secure natural drainage and the assistance of the force of gravity to run the loaded cars out. Much variation is to be found in the grades of different tunnels; ½ inch and ½ inch to a rod, being among the least employed, and from these up to grades of three inches, four inches and even more are used. In general, the lighter the grade the better. The kind of car track employed can be allowed to control the grade within certain limits.

Wherever the rock in the tunnel has a tendency to cave, slide or swell, it must be timbered, and, if necessary, lagging put in on top and at the sides. Timber roughly squared with the axe is generally employed. All of it required in the mine is usually cut, dressed and delivered by contract; 8, 10, 12 cents, or thereabout, being the cost of a single timber, and lagging costing all the way from $20 to $40 per thousand. Pine, spruce, fir and cedar from the forests which cover the mountains, furnish the supply, and enough can usually be obtained from the surface ground of a mine to supply it.

(TO BE CONTINUED.)

Men Engaged in Hydraulic Mining.

In the Gold Run debris suit G. G. Blanchard was examined as to the number of persons engaged in mining along the American and its tributaries, the quantity of material displaced by their operations, etc., and testified: They all tailed into the most convenient places; each miner displaced about 10 cubic yards of material per day; think there were from 15,000 to 20,000 miners at work in Placer county in 1851-52-53; the displacement by each miner would be about 15 cubic yards per day; there is considerable seem mining now done in El Dorado county; in 1861 there were about 15,000 persons depending on mining in that county; there are now perhaps 10,000; prior to 1862 there was probably 50 times as much material removed as since then; the earth removed between 1848 and 1862 was light and of vegetable mold; most of the heavy material mined in later years is still in the vicinity of the mines; no man can tell how far any particular kind of material would be carried in suspension in the South Fork; 10% of the material at present mined in El Dorado county would not go 30 miles from the mine; some of the lighter vegetable mold might reach Sacramento; the natural wash in the river in El Dorado county is now more than 25 times as much as from all the mines; the tailings from the mines are saved wherever possible; it makes the best land in the county; about 1,000 acres of land have been thus made, from 2 to 10 ft. deep; it will raise what the natural land will not; the blue cement rock makes the very best sort of land after it decomposes and crumbles.

The Debris Suit.

The Gold Run suit still progresses at Sacramento, many new witnesses being examined. James Marshall, the discoverer of gold in California, was one of them, and said that the whole Sacramento valley was flooded in the winter of 1845-46. He was told at that time by the Indians and those who had resided here in 1830, that during the winter of that year the entire valley was deeply submerged, the only land visible in the valley being the Buttes. The highest water he ever saw in the American river, at Coloma, was in the winter of 1861-62. Evidence along the banks, near that town, shows that prior to 1848 the river at some time had been two or three ft. higher that it has been since that time.

Hon. Niles Searle, among other things, said: The great bulk of litigation brought before me while I was District Judge, was what is termed mining litigation. The habit of the miners of Plumas, Placer, Nevada, Yuba and El Dorado counties, where I have lived, is to wash the earth in order to separate the gold, and then dump the water and debris into the most convenient canyon or ravine. This has been the universal practice in those counties, except where the miners have impounded their own debris in order to wash it a second time. After impounded tailings were washed, they were then allowed to escape through the most convenient and available natural channels. I have been through the mining counties from Amador to Siskiyou. This custom of discharging from the mines the debris into the most convenient canyons or ravines, has been the universal custom among all the miners of California, as far as my observation goes, from 1849 up to the present time. This mode of mining is the only way in which the mines could be worked profitably. Gold mining cannot be prosecuted except with the use of water. I am familiar with all the streams in Nevada and some adjoining counties, and all, or nearly all, of the canals in those counties. [Witness described the Eureka Lake, South Yuba, Rock Creek, Bloomfield, Milton and other canals, giving their locations, source of supply, and the mines they furnish with water. He also described the large reservoirs that held back large amounts of the winter's water for use in summer mining.] The canal companies I have mentioned all have large reservoirs at their sources, and some of them have a great many. Some of these are natural lakes dammed at their outlet, three or four miles in length, and varying in depth from nothing to 100 ft. The North Bloomfield reservoir, with which I am very familiar, having boated upon and fished in it for eat many times, is about four miles in length, and has an average depth of from 50 to 60 ft. The water from these reservoirs is not discharged until the waters in the creeks, ravines and natural channels fail. The amount of water discharged from the Excelsior, South Yuba, North Bloomfield and Milton mines is at least double the quantity of water flowing in the Yuba during the dry season. During the dry season, those mines discharge of this stored water, at least 20,000 miners' inches. This amount of water would make a stream 100 ft. wide and 3 ft. deep. This volume of water confined in a canal, would float most any of our up-river steamers. During the winter of 1850 and 1851, within an area of three miles of Nevada City, there was an estimated population of 20,000. At least 15,000 of this population were engaged in mining. There are not 100 men engaged in hydraulic mining within this same area at the present time. There were several thousand men mining in Sierra county in 1850. Nearly all the early mining was in light soil and shallow surface diggings.

The reservoirs supplying the canals for these mines are mostly situated near the summit. The Bowman reservoir occupies the whole of a valley. It was dammed up in a narrow gorge, and the whole valley, several miles in length and a mile wide, was thus flooded. I consider that the storing of water in the winter, and sending it down during the dry season, greatly assists in the navigation of the rivers of California.

Witness was examined minutely regarding the flow of water from the reservoirs referred to in his direct examination; the quantity of water used by miners daily along the Yuba must have been more than 17,000 inches. [The report of the County Assessor showed the quantity to be about 17,000 inches, supposing the miners to have worked 300 days per year.] The mining population in Nevada county has been largely reduced within late years.

Resuming, witness stated that when he testified that the practice among miners was to dump their tailings in the most convenient places, he simply stated a fact; there was no compulsion in the matter—they were not obliged to do so; sometimes the nearest canyon was not the most convenient one; monitors did not come into use in hydraulic mining until 1865; before that the ordinary goose-neck was used; powder was first used largely in 1853 or 1854, but in the gravel banks it was not generally used until 1865; the Excelsior, the Milton, the Eureka Lake and North Bloomfield companies do, perhaps, on an average, sometimes three-fourths and sometimes one-third of the mining now done along the Yuba; they use perhaps more than one-half of the water brought in by artificial means, but there is a great deal of mining done by aid of the natural water-channels; during the flood season, the water in most of the ravines is used for mining.

Lectures to Young Mechanics and Apprentices.

Schools of Machinery.

The last lecture given before the young mechanics and apprentices of this city, at Capt. McNavins' hall, by John Richards, Superintendent of the San Francisco Tool Co., was on the subject "Standards of Measurement as Applied to Industrial Processes." In introducing his subject, Mr. Richards said:

Before commencing the regular paper of the evening, I desire to make some preliminary remarks, and to offer an explanation.

In the first place, I desire to call your attention to the fact that we have in the United States what may be called two schools of machinery. One of these may be called the New England, and the other the Philadelphia school.

Down to a short time ago, and, indeed, now, to a great extent, the distinction between these schools was, that in Philadelphia and Western places where Philadelphia methods were adopted, the purpose was to see how well things could be made. While in New England, the first purpose was to see how cheap they could be made.

This remark I have quoted from one of the most distinguished mechanicians in New England, Mr. Brown, of Brown & Sharp, Providence.

There is also another distinction, that of ornamentation and chromatic painting.

In New England, and there alone in the whole world, was ornament made a part of machine construction.

By ornament I do not mean graceful framing with pleasing outlines, but fillegree work, beads, curves, cornices, panels, variegated colors, and of all things, varnish, that will make even the best castings look hideous.

The rivalry between these schools has grown less during ten years past. Public opinion would not support the New England methods, and most makers of machine tools and like machinery there have been compelled to adopt the Philadelphia method of casting the frames of machines in one piece, placing the metal in the line of strains, scraping surfaces to fit, and painting machines to represent what they are, iron.

The Type of Machine Tools

Made in Philadelphia, and let me remark, that type is not different from any other country, tools being made the same in nearly all parts of the world, began with Messrs. William Sellers & Co., of that city. This firm, in founding their business, very wisely examined the machine tool practice of Europe, and imitated many of Whitworth's designs, or as I should say, his fitting. Some of these original designs, notably, shaping and slotting machines, have not been much changed down to this time.

Messrs. Sellers & Co. made many important inventions, some of which have been employed all over the world and are copied by the best makers in this country.

These remarks are preliminary to calling your attention to a paper read before the late meeting of the Mechanical Engineers' Society, at Hartford in Connecticut. This paper is a commercial bid for business on behalf of an Eastern firm, and its principal feature is the manner in which it ignores all that has been done by myself and others in the construction of accurate gauging machines and implements in this country.

Prof. Rodgers, of Cambridge University, was sent to England to hunt up standards, and after procuring various kinds, Messrs. Pratt & Whitney constructed two machines for *visual* divisions of these standards—the old idea of microscopes, hair lines, etc., that will no doubt fail, as all future experiments of the kind must. No scientific man has ever divided a lineal standard in this way. It is the expedient of a scientific man, not a mechanic. Fifteen thousand dollers, we are told, has been expended in this hunting for a standard, and no implements have been made. Everything done has been paraded before the engineers of this country, in a manner that too plainly indicates what I will call "huncombe." The divisions made at Philadelphia were mechanical; so were those of the Whitworth company, and I incline to the opinion, that in a common machine shop in Cincinnati 20 years ago, was made a set of divisions for a foot that were more true than we will ever have from the Cambridge visual machines, or any other constructed on that plan. The divisions referred to were made at the Niles Tool Works.

The animus shown at this meeting revives the old

Controversy Between the two Machinery Schools

I have named. It is the old paint and fillagree school again; ignoring all that has been done, and quietly assuming they are about to begin a *new* business in making gauges. The difference between saying and doing is very great. They will find two things out before they have done. One, that no visual division of the yard or meter will be perfect, and that in making gauges, a standard is by no means the greater part. This brings me to the explanation.

It was my intention to have prepared for this society a paper on the various processes of making exact implements, including various phenomena that arise in such processes, both as to the nature of material and the cutting or abrading operations employed to attain precision. This I cannot do at this time; it would be of too much use to those people who have commenced to work at Hartford.

Instead, I will speak of standards; leaving to some other time the processes of preparing implements.

In a late number of the "American Machinist" some one has told us all about

"Gauge Making,"

And claims to be himself a practical maker of such implements. As many of you as have read this learned essay have, no doubt, been astonished at some of its propositions, especially if there are any here who know the processes for making cylindrical gauges in Europe.

He informs us how the Whitworth Co. test their gauges, a matter, I am afraid, he knows nothing about, especially as I am able to controvert his statement fully. We are also informed of the wonderful swelling and shrinking of steel gauge pins in two directions—first one way, then another. This alone will, I think, furnish a true measure for most of the dogmatic statements the article contains.

Away out here, where we do not know much of mechanics, and only make quartz mills and the like, there are no doubt several, if not many, who know something of the change that may, not does, take place in such pins when made from rolled bars.

Such change is due to what may be called lamination; it is exceptional and infinitessimal, not constant and marked, as the writer in the *Machinist* would have us think.

In respect to the remarks made in the same article about "snap gauges," if the writer means calipers, I do not know what a snap gauge is. He is very far wrong in mentioning these as less difficult to make than pins or collars. I will, however, have something to say of this in a future place, and will now proceed with the regular paper of the evening.

This paper, I may explain, is a revision of one read before the Academy of Sciences some months since.

[Having published the original extended paper in the MINING AND SCIENTIFIC PRESS of Oct. 15th, 22d and 29th, 1881, with illustrations, it is not necessary to give the abstract.—EDS. PRESS.]

Detection of Copper.

The green color which most copper compounds give to the blow-pipe flame, and the reactions of its oxides with the fluxes, render its presence easily detected. The production of a red heat with salt of phosphorus in the reducing flame of the blow-pipe, is rendered more certain by the treatment of the heat or charcoal with a small amount of tin.

Copper may also be detected by saturating a salt of phosphorus heat with the substance containing it, and adding chloride of sodium, when the heat will color the flame beautifully blue, owing to the formation of chloride of copper.

Many minerals give this reaction by simply moistening in hydrochloric acid, and exposing in the platinum forceps to the flame. Silicates should be first pulverized, moistened with hydrochloric acid, and evaporated to dryness in a porcelain; then made into paste with water.

Brush, in his "Determinative Mineralogy," adds to the above that, in case the copper is combined with nickel, cobalt, iron and arsenic, the greater part of the cobalt and iron may be separated by treating with borax or charcoal. The remaining metallic globule is fused with a small quantity of pure lead, and then boric acid is added; this last dissolves the lead and the rest of the cobalt and iron, while most of the arsenic is volatilized. The cupriferous nickel globule, which still may contain a little arsenic, is treated with salt of phosphorus in the oxidizing flame; the heat obtained will be dark green while hot, and clear green when cold. The last green is caused by a mixture of the yellow of oxide of nickel and the blue of oxide of copper.

According to Guericke, a very delicate test for copper is to mix the substance under examination intimately with chloride of silver, and fuse on iron wire. In this manner the smallest quantity of copper may be detected by the blue color imparted to the flame.

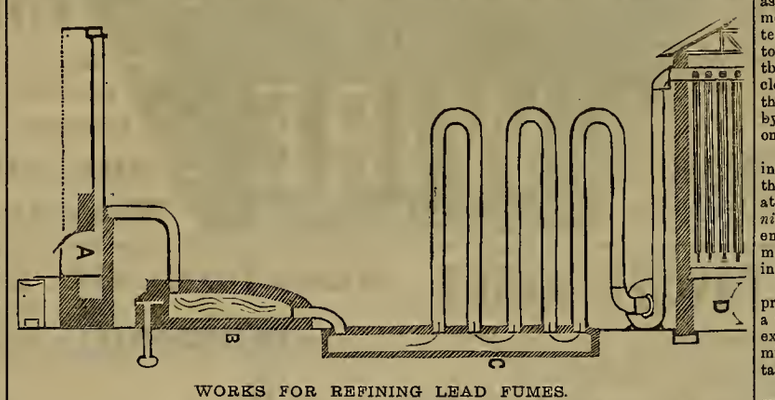
THE Alexander mine, at Grantsville, Nye county, Nev., has been sold to Ferdinand Van Zant, for an Eastern company, for the sum of $676,000. The money was paid down in one check.

Process of Refining Lead Fumes.

Generally white lead pigments have been manufactured from galena, or other lead ores in raw or roasted state, by subjecting them to the joint action of heat and air, according to the quality of the lead ores used; or it has been manufactured from waste lead fumes from lead smelting and refining by passing them through externally-heated tubes, retorts, or muffles before catching the fumes, or by returning the crude fumes after first collecting them in bags or screens of textile fabric and then again collecting the refined lead fumes.

By these processes the refined fumes are dissolved by particles of carbon or sulphurets of lead, or both, if the greatest care is not taken in keeping a bright fire in the furnace, and in the selection of the fuel. In the case of waste fumes these are nearly always gray, and sometimes almost black.

Two inventors, C. T. Lewis, of Philadelphia, and E. A. Bartlett, of Pemberton, N. J., have found that by passing the fumes, after leaving the furnace where they are formed, over or onto a bright or clear fire, or by passing them through a furnace in which generated gas is burned, the dark and black particles are all burned out, and the fumes are refined; and after passing through the cooling pipes, they can be caught in the bags of textile fabric, and will be in the form of a white powder. The accompanying drawing shows works constructed on this principle. *A* is a Scotch hearth, where the fumes are produced. From there they pass into the furnace, *B*, which is heated by a flame of generated gas, which burns out all the impurities contained in the incoming fumes, which it purifies, and the purified white lead fumes then pass through the cooling pipes, *C*, and are blown into the catching or screening apparatus, *D*.



WORKS FOR REFINING LEAD FUMES.

The inventors prefer to use a generated gas flame, on account of uniformity of composition and easy management. This process will probably work well in all cases, except where they have to deal with waste fumes from smelting raw and unroasted sulphuret of lead. In this case they will find a great deal of sulphuric acid is produced, and the process will not work well, except when the fumes are passed into the coal fire.

INDIAN PEAK MINES.—Charles Brunson writes us from Indian peak, Fresno county, as follows: The work in the mines, around and in the vicinity of the Indian peak, is progressing in real earnest. The Surprise mine has a shaft down 115 ft., and prospects well. Parties owning the Eagle mine have started work again. The rich cross lead, Gambetta, which runs across the Eagle location, is turning out very rich ore. Some of the ore has worked up in the thousands to the ton. The shaft is down 140 ft. Mr. L. Voyle and Mr. Chas. Burt, of Knight's Ferry, have bought the controlling interest in the Hancock mine, and are preparing to go to work. The vein prospects well, and lies in a talc formation and prospects from wall to wall. The Red Rover is also a very promising mine, and has a shaft of 60 ft. There are also other locations that look well and give promise of being rich in gold. Fresno river is only 1½ miles from these mines, where there is plenty of water for milling purposes. There is plenty of timber and one of the best climates in the State. The great Madeira lumber flume, that is 60 miles long, passes 1½ miles from the mines, so that all sorts of lumber can be delivered.

THE 40 stamp mill at the Providence mine, Nevada City, is in operation night and day, crushing 100 tons of ore every 24 hours. The new arrangement by which water is brought from the Snow Mountain ditch through 1,600 ft. of 22-inch pipe, works to a charm. It is believed that 90 inches of water, or 10 inches less than is now being used, will furnish sufficient motive power, the fall being nearly 400 ft.

A GENTLEMAN in from Ward informs the White Pine *News*, on what he considers good authority, that between 1,500 and 2,000 tons of good ore has already been stoped out in the Paymaster mine at that place. The mill will be started up in the spring.

An Address from the Miners' Association.

The Miners' Association of this State has addressed to the mine owners of California and members of the association the following appeal:

Gentlemen:—We desire to call your attention to the pecuniary necessities of this association arising from the protracted and vexatious litigation now pending and in progress in the courts, which involves the very existence of the mining industry in California.

In addition to the cause now on trial in Sacramento (State of California vs. Gold Run Mining Company), we are defending in the Superior Court of Yuba county 32 suits, wherein the city of Marysville is the plaintiff; and also, in the Circuit Court of the United States, the case of State of California vs. Miocene Mining Company, of Butte county. Any of these said actions, if finally decided in favor of the plaintiffs, will seriously injure the value of all classes of mining property in our State.

The case now on trial at Sacramento has assumed a broad scope, and may be considered a test case of most of the important issues in the conflict of the miners with the anti miners. Realizing the magnitude of the interests involved, the association, as is well known, has engaged the services of the most eminent counsel, and the best engineering skill in the State, and it has spared no expense in presenting the miners' side of the case in such a manner, that, if appealed to the highest Court in the country—as it will be by one or the other parties in interest—we shall have a complete record.

It is in contemplation, as soon as the trial of the "Gold Run case" has been closed, to call a convention of miners, under the auspices of this association, of which due and timely notice will be given in the newspapers and otherwise, as to the time and place, to consider ways and means for the common defense of the mining interests and rights. All miners will be invited to attend, irrespective of their connection with this association, and without reference to the class of mining in which they are engaged, as the mining interest at large is placed in jeopardy by these continued and persistent attacks upon it.

In the defense of the common property and interest, as well as the rights of the miners, the burden has fallen heavily upon this association, and unless it has the moral and *pecuniary* aid of the mine owners at large, so as to enable it to meet all these issues, the result may be equivalent to a confiscation of all mining property.

The association suggests to its members the propriety of co-operation in this measure, with a view to the formation of a more perfect and extended organization, so as to defend the mining interests whenever and wherever attacked in our State.

In conclusion, this association urges all active members to use their influence to induce mine owners, who are not members, to become such; for it is quite certain, in this grave struggle to protect the rights of the miners, that this association will require the united support, both moral and financial, of the entire mining interest of our State.

HAMILTON SMITH, JR., President.
L. L. ROBINSON, Vice President.

Board of Council:—Egbert Judson, L. L. Robinson, Thos. Price, Hamilton Smith, Jr., Wm. Ashburner, R. E. Brewster, M. A. Sheppard, Thos. Bell, Alvinza Hayward, J. B. Haggin, J. P. Pierce, A. A. Sargent; W. A. Skidmore, Secretary.

Debris Dams.

United States engineers, under Colonel Mendell, acting in the interest of the Federal Government, have been making very careful surveys of the Yuba, American, Feather, Calaveras, Mokelumne and Cosumnee rivers, seeking for the best localities where dams may be constructed, and reservoirs for mud wherein slickens may be retained. The topography of the country has been carefully examined and mapped, and possible storage places noted. One party of engineers under Marsden Manson, surveyed the upper rivers—that is, the Calaveras and Mokelumne and Cosumnes. Another party, under Lieutenant Payson examined the Yube, American and Feather. The result of their explorations is that they have selected locations for the construction of reservoirs that will hold the sediment for five years to come. In all, six lakes will probably be constructed. One, the largest, will be on the Yuba, just below the Smartsville dumps. Another will go upon the American, just where, is not yet decided—probably near its exit from the hills. There are about a dozen other localities where reservoirs may be put in, and it will depend upon the amount of the appropriation which will be selected. Mr. L. J. Le Conte, Assistant United States Engineer, is of the opinion that by the time the five years have elapsed, when new reservoirs must be constructed, the Sacramento will be cleared of its deposits. The slope of the stream bed has been gradually increased by filling up of the hollow at the middle of the stream, allowing the round howlders to be rolled down by the freshets. The sediment in the reservoirs will sink, allowing comparatively clear water to overflow, and this water, particularly in freshet times, will scour out the river bede, restoring navigation.

Col. Mendell is of the opinion that the miners will materially aid the government it its work.

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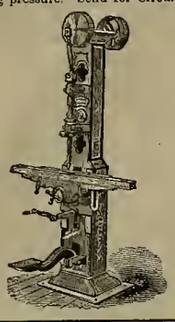

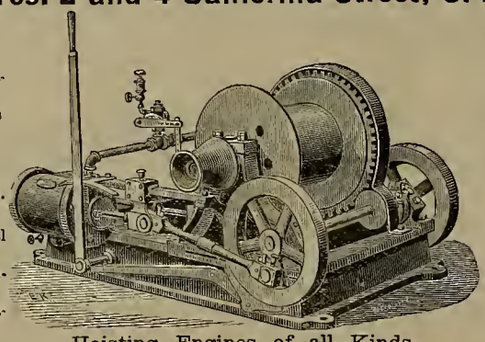

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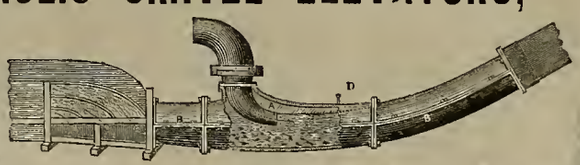

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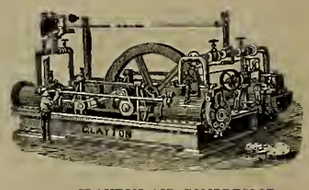

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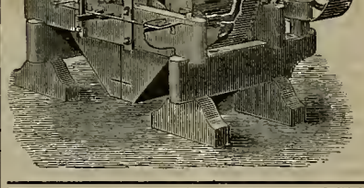

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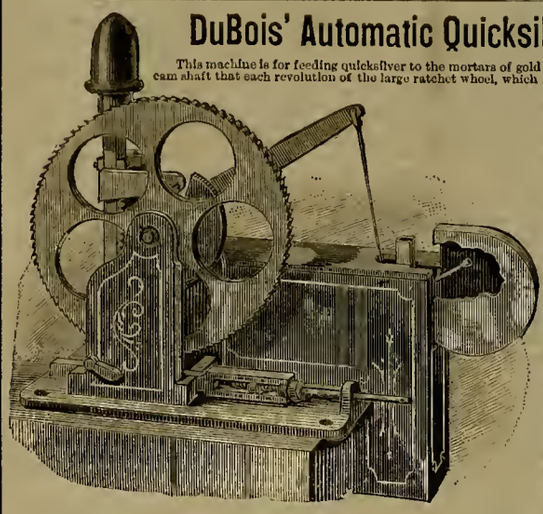

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15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over other Steel Castings.
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IN THEIR VARIOUS FORMS.
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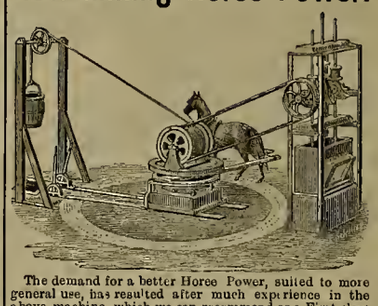
New Mining Horse Power.



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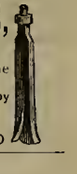

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☞Reports, Surveys and Plans of Mines made.☜

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING DECEMBER 27, 1881.

251,402.—PAPER BAG MACHINE—A. Beyer, Oakland.
251,408.—FRUIT DRIER—R. E. Burns, S. F.
251,577.—RECEPTACLE FOR PACKING SOAP—N. W. Griswold, S. F.
251,361.—MAIL POUCH FASTENER—R. H. Hewitt, Los Angeles, Cal.
251,442.—GRINDING AND AMALGAMATING PAN—F. A. Huntington, S. F.
251,595.—HARVESTER FINGER—C. J. Johnson, Lone Pine, Cal.
251,443.—SPRAY NOZZLE—Long, Vestal & Merigot, San Jose, Cal.
251,373.—COMPRESSING PUMP—S. D. Lount, Arizona Ter.
251,449.—BOX FASTENER—Chas. Martell, Vacaville, Cal.
251,615.—SHACKLE FOR HORSES—J. C. McCollum, Los Angeles, Cal.
251,617.—EGG AND FRUIT CARRIER—John J. McIntire, Oakland, Cal.
251,464.—SHACKLE—Jas. T. Rogers, Westport, Cal.
251,480.—CARPET BEATER—John Spaulding, S. F.
9,990.—POWER STEERING APPARATUS FOR VESSELS—A. J. Stevens, Sacramento, Cal. (re-issue.)
251,435.—FURNACE—Henry R. Taylor, S. F.
251,488.—PORTABLE HAMMOCK—N. Vizelich, Stockton.
251,417.—RAILWAY SWITCH—M. R. Dahlgreu, Oakland.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

SHACKLE.—James T. Rogers, Westport, Mendocino county, Cal. No. 251,464. Dated Dec. 27, 1881. This invention relates to a new and useful device for uniting cables; and it consists of an open link, the shanks of which are perforated, and have extended slots connecting therewith, through which a bolt passes, said bolt bearing a tug or projection at the end opposite the head and a rib to fit between the shanks at the link. The bolt passes through the adjacent closed link, so that the bolt after being introduced through it, will be turned by it so that its tug and rib will turn away from the slots in the shanks of the open link, whereby it will be locked in place and retained. The object is to provide a convenient and easy connection for chains or cables which are fastened to buoys. In the ordinary method the bolt is fastened with a key, which is separate therefrom and is liable to be lost or misplaced at a critical moment. In this invention this is obviated by having the bolt fastened by the extended rib, which, being connected therewith, cannot be lost and is operated by the cable itself.

HYDROCARBON BURNERS.—Evan A. Edwards, San Buenaventura, Ventura Co., Cal. Dated, Jan. 3d, 1882. No. 251,849. This hydrocarbon burner is in the class adapted to burn liquid fuels and to be attached to steam boilers. It consists in a peculiar and novel construction of parts, whereby the steam, oil and air open out separately from the end of the burner. The steam is conducted in a separate passage around the oil passage, and allowed to mix with and atomize the oil only after said oil has passed its valve and is beyond the end of the burner—a point of advantage being herein considered. The air is drawn in through a passage made through the valve stem, so that the oil, steam and air come together beyond the mouth of the burner, and within the combustion chamber of the furnace.

SELF-CLOSING STOPPER FOR BOTTLES.—David Berry, Bolinas, Marin Co., Cal. Dated Jan. 3, 1881. No. 251,819. This invention relates to a novel means for closing the mouths of bottles without the use of corks or other stoppers; and it consists in the employment of a supplemental cap, which may be fitted to the mouth or neck of any bottle by suitable means, and is provided with transversely moving slides, which close across the mouth and are operated by closing springs and levers, by which they may be opened. The device may easily be placed upon any bottle or transferred from one bottle to another.

GRAIN CLEANER.—Wm. Williamson, Rio Vista, Solano Co., Cal. Dated Jan. 3, 1882. No. 251,994. This invention relates to that class of agricultural implements known as grain cleaners, in which the grain is received upon shaking screens and subjected to the action of a blast of air from a revolving fan. It consists in such a construction of the screen-containing shoe and the means for operating it as will impart to the screen a peculiar movement, very effective for the purpose.

THE funeral of the late George Daly, the well-known mining man, who was killed by the Apaches in New Mexico on the 18th of last August, took place on Thursday, from Grace Church, in this city.

Aliens and Relocations of Mining Claims.

The following decision of the Supreme Court of Nevada is of interest to locators of mines and to alien citizens:

The decision is in the case of S. Sever and John Chiatovich, respondents, vs. E. Gregovich, appellant:

This is an action to recover the possession of an undivided one-half interest in a mining claim.

Plaintiffs obtained judgment and defendant appeals.

The facts are, that on the 1st of August, 1867, S. Sever and E. Gregovich located the mining ground in controversy, viz.: 600 ft. in length of the Georgs Washington lode, 200 ft. thereof being for a discovery claim; that on the 15th of February, 1873, Sever conveyed his interest therein, by deed, to B. Evanovich; that on the 10th of May, 1874, Evanovich conveyed the same interest to the plaintiffs; that on the 24th day of September, 1872, Evanovich declared his intention to become a citizen of the United States, and received his naturalization papers on the 8th of September, 1873; that on the 6th of June, 1876, Sever declared his intention of becoming a citizen, and afterwards, and before the relocation of the premises by the defendant Gregovich, he was duly naturalized, and became a citizen of the United States; that on the 18th of February, 1880, the defendant, Gregovich relocated the mining ground in controversy in his own name, without the consent of plaintiffs, or either of them; that during all the time from the first location of the claim by Sever and Gregovich until the relocation of the premises as above stated, the work and labor as required by the Statutes of the United States and the laws of Columbus mining district, where said claim is located, were performed by said parties, and that during all of said time said Evanovich, or said plaintiffs, with the consent and assistance of said defendant, and jointly with him, had the said work and labor performed, and that during said time the said Sever and Chiatovich have paid to the said Gregovich various sums of money for his doing their proportionate part of said work and labor.

Upon the trial, the defendant offered to prove that the Victor mining claim was discovered and located for several years prior to the 1st of August, 1867, and was upon the same lode as the Georgs Washington claim. The object and purpose of this evidence was to show that the locators of the George Washington claim were not the discoverers of the lode.

Appellant, Gregovich, claims that the Court erred in refusing to admit this testimony, and that Sever, being an alien at the time of the first location of the claim, had no right to hold or claim an interest therein, and for these reasons the relocation of the claim by himself was valid, and the respondents have no valid interest or claim to any portion of said mining ground. We are, however, of the opinion that the judgment of the District Court is correct.

Appellant in not in a position to take advantage of the defects, if any exist, in plaintiff's title to the ground in dispute. He joined with Sever in claiming 200 ft. of the ground as a discovery claim, and afterwards recognized the claims of Sever, Evanovich and Chiatovich to the mining ground, including the discovery claim of 200 ft., as being valid. He accepted from them their proportionate share of the money expended for work and labor done upon the entire claim, and for these reasons he was and is estopped, by his conduct and acts, from denying the rights claimed by Sever and Chiatovich as owners therein. (1 Green on Ev., Sections 207, 208; Herman on Estoppel, Section 336; Lessee of Merritt vs. Horne, 5 Ohio St., 318.)

The judgment of the District Court is affirmed.

THE RAILROAD COMMISSION.—At the meeting of the California Railroad Commission this week, Gen. Stoneman called up his resolutions, introduced last November (which we published at the time), requiring the companies to furnish second-class accommodations to holders of second-class tickets, at rates not exceeding 60% of the first-class fare. The resolutions also contained clauses to the effect that second-class passengers should not be obliged to ride in the smoking cars, and that they be entitled to the same privilege of "lay-over" tickets as the first-class passengers. A warm debate ensued, and the resolutions were finally laid aside for want of a second. To say the least, this is unfortunate. Second-class passengers have rights which ought to be protected, and they are generally less able to "stand up" for them than first-class ones.

REPORTS from Magdalena are to the effect that the State Congress of Sonora has abolished all tax on mines, mining machinery and capital invested, and proposes to make a light tax only on the net proceeds of the mines.

Two mills in Six-mile canyon are running on ore from Lady Bryan croppings. Thos. Holley is running two mills on Monte Cristo ore. There is now sufficient water for all of the canyon mills.

THE total assessment of San Bernardino county for 1881, outside of the town, is $63,126.96, and $43,312 was collected.

News in Brief.

RICHARD H. DANA, JR., died in Rome, Italy, Saturday.

THE best feminine help in Sweden receives $4 a month.

SMALL-POX caused 450 deaths in New York city in 1881, against 31 in 1880.

THE East river bridge needs $600,000 more to complete the structure, which has already cost $13,377,000.

ASHCROFT, Colorado, is to have two smelters. The town trustees have donated a tract of land for that purpose.

A GENERAL arrest of saloon-keepers was made at Willows on Monday for disregarding the Sunday law on the previous day.

ADDITIONAL copper discoveries are reported from the Santa Catalinas, Arizona. The bodies of ore are reported to be very large.

THE annual copper product of the United States is now given in a supplement to the census at 50,655,140 lbs, worth $8,842,961.

THE gallows to hang Garcia on next Wednesday is already erected at San Buenaventura, but an appeal will be taken to stay the execution.

THE profits of the Richmond M. Co. (Eureka) during the past six months, after paying all expenses, have been over a quarter of a million of dollars.

THE contract awarded to Lynde & Co., on the mountain division of the Northern Pacific, W. T., calls for 500,000 ties and 10,000,000 ft. of lumber.

IT is said that 7,000 negroes in South Carolina have agreed to join the present "exodus" to Arkansas, and whole neighborhoods are being depopulated.

THE Postoffice Department issued stamps to the value of $640,000 last Saturday, the largest ever known, being 20,000,000 stamps and 6,000,000 postal cards.

THE total cost of the St. Gothard tunnel, which was opened last Sunday for the regular passage of trains, is 56,808,620 francs, something over $11,000,000.

THE fact that the present year of grace, 1882, is to have one Sunday more than most years, is regarded by many good people as a cheerful omen for the advance of the gospel.

IT is reported that the new steamer Walla Walla will be sent from Portland to Hongkong with flour, and return with 1,000 Chinese to work on the North Pacific railroad.

NEWS from El Paso, Tex., is to the effect that small-pox has broken out there to an alarming extent. There are nine cases in New York, and it is spreading in Jersey City. It is increasing rapidly at Pittsburg.

SPECIAL dispatches from points in Ireland show a great development of the latest form of lawlessness, namely, Land League hunts. A number organized Friday. In rare cases, where the authorities had not had time to interfere, quantities of game were destroyed and preserves damaged.

ORDERS have been received at New Orleans from San Francisco to provide freight room in March and April for 180,000 bushels of wheat for Great Britain. This wheat is to be shipped from California to New Orleans by the Southern Pacific railroad, thence by steamer to its destination.

Business Offices and Sunny Rooms to Let.

We have some desirable rooms to let adjoining the offices of this paper which will be rented on favorable terms. Stair entrance, No. 252 Market St. Elevator, No. 12 Front St. Parties wishing offices, etc., will do well to call and see them. DEWEY & CO.

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THE MINING AND SCIENTIFIC PRESS is the leading mining journal in America, and enjoys a larger circulation among the more intelligent operators and workers in the gold fields of the world.

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Among its contributors are the ablest and most experienced mining engineers, superintendents and practical miners in this country.

The PRESS gives a condensed summary of Mining News from the most important mining districts of the country.

New processes and methods of mining are described in its weekly issues. New mining machinery and improvements are frequently illustrated and explained in a manner to be of great value to all interested in mining.

As a scientific and mechanical representative of the Pacific coast it is decidedly popular, and a standard journal with the most thrifty industrial people of the Pacific States and Territories. Its authority is of the highest order, and its usefulness in its special sphere unrivalled.

Every public library, mining engineer, metallurgist, mining operator and intelligent mechanic and manufacturer, will find profit by its reading.

Subscription, $4 a year in advance. Sample copies, postpaid, 10 cents.

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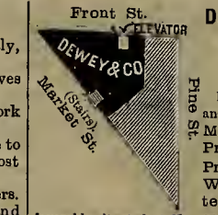

Dewey & Co.'s Patent Agency and Newspaper Offices.

Dewey & Co.'s Patent Agency and the business offices of the Mining and Scientific Press, Pacific Rural Press, Pacific States Watchman and the Fraternal Record are now favorably situated at No. 252 Market Street. Elevator entrance, *No. 12 Front St., S. F.*

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OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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M. P OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARAN C. HOAG—California.
B. W. CROWELL—Humboldt and Trinity counties.
D. W. KELLENER—Merced, Fresno and San Benito.
A. C. KNOX—State of Nevada.
EDWARD A. WEEN—San Francisco.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct, or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

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PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central system in San Francisco.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

COPP'S "U. S. MINERAL LANDS, LAWS, FORMS, INSTRUCTIONS AND DECISIONS."—1881. 570 pp. In full law binding, $4.50; half law binding, $3, at this office.

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San Francisco Metal Market.

[WHOLESALE.
THURSDAY, January 5, 1881.

IRON.—		
American, Pig, soft, ton	— —	@30 00
Scotch, Pig, ton	25 50	@27 50
American White Pig, ton	— —	— —
Oregon Pig, ton	— —	@29 00
Clipper Gap, No. 1	— —	@28 00
Clipper Gap, White	— —	@32 00
Clipper Gap Car Wheel	— —	@36 00
Refined Bar	4	@
Horse Shoes, keg	—	@ 5 50
Nail Rod	—	@ 7¼
Norway, according to thickness	6½	@ 70
STEEL.—		
English Cast, lb	13	@ 15
Black Diamond, ordinary sizes	—	@ 15
Drill	15	@ 16
Flat Bar	16	@ 18
COPPER,—		
Ingot	—	@ 22
Sheet	—	@ 29
Sheating, Timed 14x18	—	@ 31
Nails	—	@ —
Bolts	—	@ 33
Old	—	@ —
Bar	—	@ 22
Cement, 100 fine	—	@ 15½
LEAD.—		
Pig	—	@ 5
Bar	—	@ 6
Pipe	—	@ 8
Sheet	—	@ 8
Shot, discount 10% on 500 Bags		
Drop, per bag	—	@ 2 10
Buck, "	—	@ 2 30
Chilled "	—	@ 2 50
TIN PLATES.—		
10x14 I C Charcoal	—	@ 7 50
10x14 I C Coke	6 15	@ 6 40
Banca Tin	—	@22 50
Australian	—	@23 50
I. C. Charcoal Roofing 14x20	—	@ 6 90
ZINC.—		
By the Cask	—	@ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	—	@ 10
NAILS.—		
Assorted Sizes	4 00	@ 4 15
QUICKSILVER.—		
By the flask	@37½	41
Flasks, new	— —	@ 1 25
Flasks, old	— —	@ 1 05

Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

San Francisco, Cal., January 10, 1882.

At a meeting of the Board of Directors of the above named company, held this day, dividend No. 59, of fifty cents (50c) per share, was declared, payable on Monday, January 16, 1882. Transfer books closed on Wednesday, January 11, 1882, at 3 o'clock P. M.

WM. WILLIS, Secretary.

Office—Room No. 29, Nevada B'ock, No. 309 Montgomery Street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company,

San Francisco, January 10, 1882.

At a meeting of the Board of Directors of the above named Company, held this day, a Dividend (No. 25), of Twenty five Cents (25c) per share was declared, payable Monday, January 16th, 1882, at the office of the Company, room 10, No. 328 Montgomery Street, San Francisco, Cal. Transfer books will be closed on January 11th, 1882, at 3 P. M.

JOSEPH NASH, Sec'y.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company,

SAN FRANCISCO, DECEMBER 31, 1881.

At a meeting of the Board of Directors of the above named Company, held this day, an extra dividend, No. 37, of seventy-five cents (75c.) per share was declared, payable on Thursday, January 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Company, in New York.

WM. WILLIS, Secretary.

Office—Room 20, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

DIVIDEND NOTICE.

San Francisco Savings Union.

532 California St., corner Webb.

For the half year ending with December 31, 1881, a dividend has been declared at the rate of five (5) per cent. per annum on Term Deposits, and four and one-sixth (4 1-6) per cent. per annum on Ordinary Deposits, free of Federal Tax, payable on and after Wednesday, January 11, 1882.

LOVELL WHITE, Cashier.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half-year ending December 31st, 1881, the Board of Directors of THE GERMAN SAVINGS AND LOAN SOCIETY has declared a dividend on Term Deposits at the rate of Five (5) per cent. per annum, and on Ordinary Deposits at the rate of four and one-sixth (4 1-6) per cent. per annum, free from Federal Taxes, and payable on and after the 9th day of January, 1882. By order,

GEO. LETTE, Secretary.

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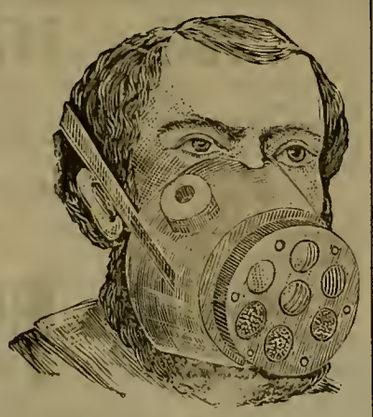

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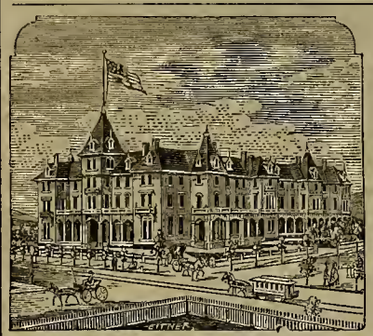

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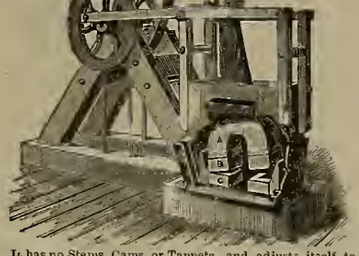
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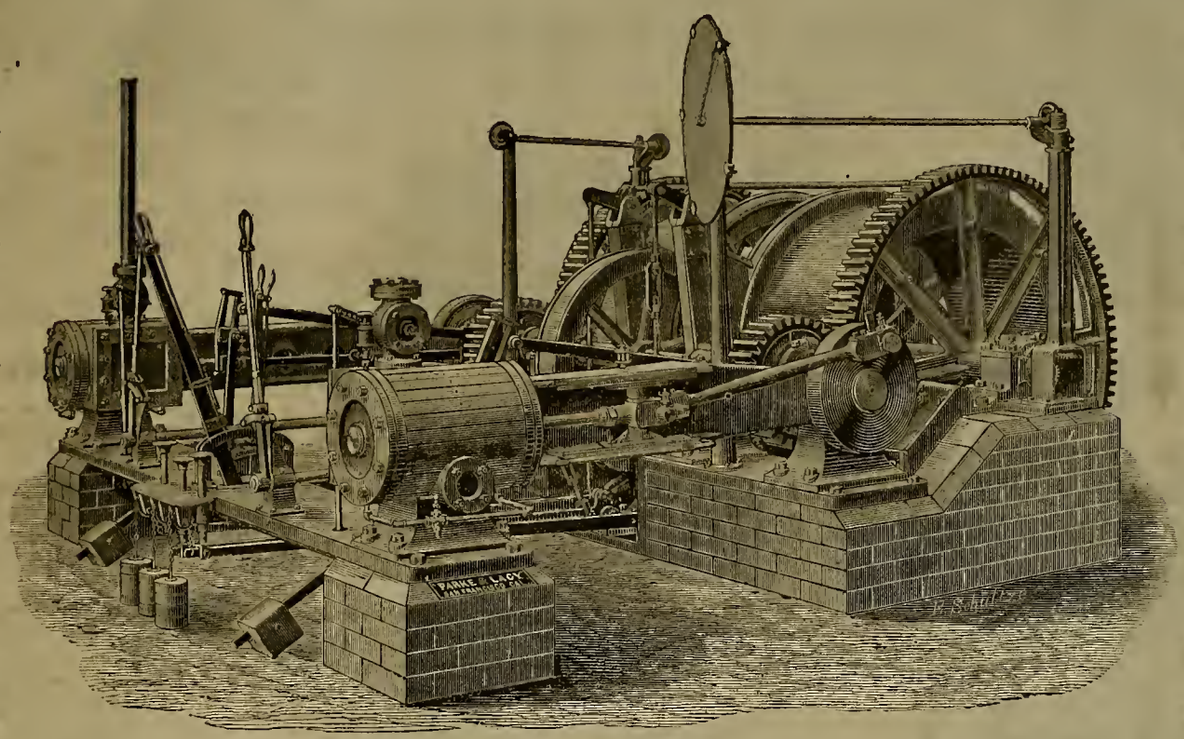

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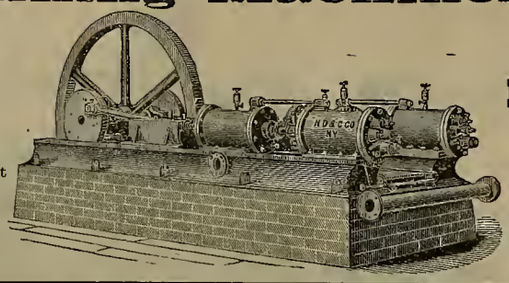

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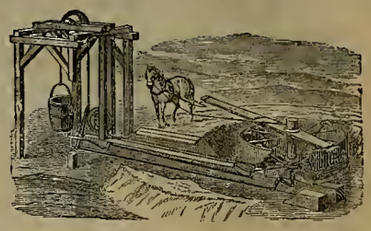

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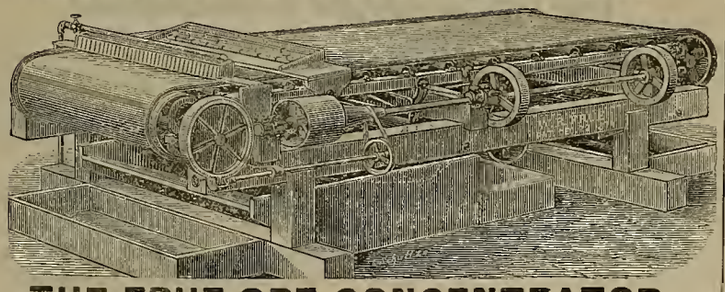

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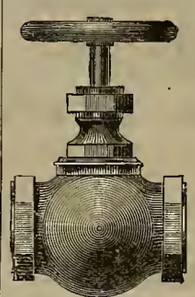

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Process of Treating Copper Ores.

A process specially applicabls for copper pyrites bas rscently been inventsd by C. Tessie dn Motay. Thess orss have hitherto been very difficult to rednce, the expense of ths process being gensrally more than ths valne of the re-snlt. This nsw process, bowsver, is simpls, rs-quiiing comparatively littls fuel, and reducing the pyrites, in one opsration, to the state of metallic copper. Tbs manner of treating tbe pyrites is by forcing tbrough them, while in a melted condition, air, steam and a combustible gas.

Fig. 1 of ths accompanying engraving, reprs-sents a vertical section through the reducing furnace used in this process. Fig. 2 represents a vertical section of a modified form of the apparatus.

The apparatus consiete generally in a chamber or furnace eo constructed as to contain the melted ores to he treated, and to facilitate the forcing tbrough the oree in a molten condition of the various gases before referred to. In the form sbown in Fig. 1, it consists generally of a U-sbaped chamber or furnace, one end being closed and the other being open for the escape of the gases, aud connected with the chimney, *G*, as ehown. The chimney is divided by a partiton, *R*, as shown, provided with an opening, *O*, at its bottom. In other words, the partition does not entirely divide tbe ohamber. Arranged to communicate with tbe closed portion of the cbamber are tbree reservoirs containing the gas, eteam and air respectively. Tbese reservoirs nre not sbown in Fig. 1, but are represented in the modified form in Fig. 2.

Tbese cbambers commnnicate with the furnaces by pipes, *a*, *b*, c, each provided with valves, *V*. The first one of these chambers or vessels, *A*, contains a combustible gas, preferably that known as "water gas," at a suitable pressure, say of three or four atmospborss. The vessel, *B*, contains steam, preferably superheated, and at abont the same pressure.

The steam used in the vessel, *B*, may he prodnced by tbe same apparatus which makes the water gas contained in the vessel, *A*; or the veesel, *B*, may represent a boiler preferably provided with a suitable snperbeating apparatus. Tbe furnace, *F*, is also supplied with a snitable supply aperture, *P*, and a delivery aperture, *D*. These are arranged to be properly closed by plnge or valves.

Tbe coppsr pyrites having bsen first melted in an apparatus suitably arranged, are cansed to flow into tbe furnace, *F*, through tbe supply opening, *P*. The vessel containing compressed air, wbich air may also he heated, ie put in communication by meane of the tube, *C*, with tbe closed portion of tbe furnace cbamber. The pressnre exieting in tbis portion forces the air downward and through the melted pyrites beneath. The resnlt of tbis operation is that the snlpbnr oxidizss, burning with great heat, eerving to still further liqnify the mass, and leaves it in tbe condition of mingled oxide and protoxide of iron, and oxide and protoxide of copper.

The communication with the reservoir of steam is then opened, whicb canses the mingled air and steam to pase tbrongb the molten mass. Tbe resnlt of thie is tbe conversion of the oxide and protoxide of copper into the protoxide of coppsr, and tbe protoxide of coppsr being heavier, falls to tbe bottom, and tbe protoxide of iron floats on its surface.

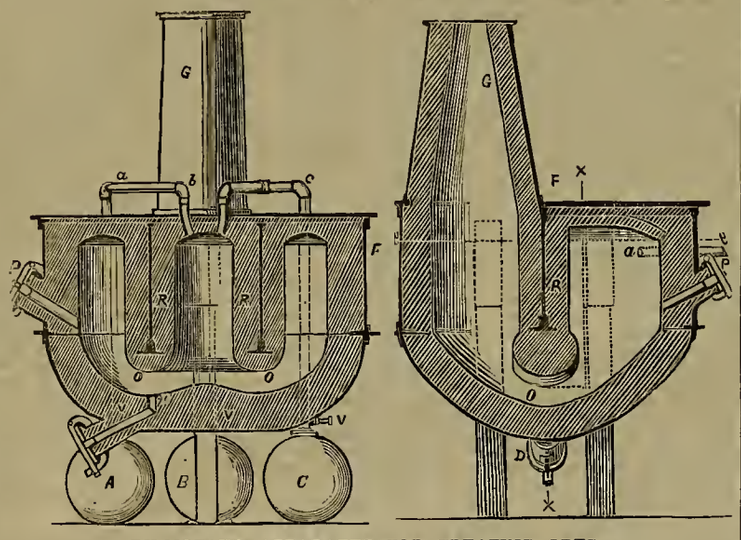
As soon as all tbe sulpbur has been oxidized, which ie known by tbe circnmetance tbat sulpburous acid ie no longsr formed, the supply of steam is cut off, and the third reservoir, containing the combustible gas, is put in communication with the closed end of the furnace. Tbis gas mingling with the air, which is bsing supplied through the pipe *C*, burns with great inteneity and tboroughly liquifies tbe iron and copper contained in the furnace.

The gas used should be one containing a certain amount of hydrogen, eitber free or in combination with a gas, and a certain amount of water in the condition of steam. Tbe supplies of ore and of combuetible gas are so regnlated that the resulting flame is a reducing-flame, the gae being in excese of tbe quantity which can be burned witb the air.

Tbe result of this operation is that tbe protoxide of copper is reduced to ths condition of metallic copper, bnt tbe protoxide of iron is not rsdnced, owing to tbe prssence of tbs water of combnstion. Whsn tbis bas besn thoroughly accomplished, the dslivery aperture is opened, and tbe mslted coppsr is allowed to flow ont through the aperture, *D*. The mslted protoxids of iron follows, and may bs recsived in a sspsrate receptacle, or may be allowed to fall upon the top of tbs coppsr, from wbicb, wbsn cool, it is easily separated by a blow.

Figure 2 rspresents a modification in wbich an annnlar partition divides a cylindrical retort into two portions, the innsr one bsing clossd for the reception of gas, steam or air, hsfors referred to, and the outer, or annnlar chamber being in commnnication with the atmosphere by the cbimney, *G*. The gas escapes from the inner cbamber through the annular ohamber, *O*, and so into tbe atmospbere. Tbe operation is precisely similar.

Good Mine and Mill.—The Mayflower mine,



DU MOTAY'S APPARATUS FOR TREATING ORES.

belonging to tbe Bristol S. M. Co., Bristol dis. trict, Nev., is shipping ore to the mill tbat is running from $300 to $1,000 per tou. Tbe *Times* says: The clean-up made at the mill two daye ago for the last six days' run amounted to $26,000, the silver bars being stacked up like so much cord wood, reminding one of tbe palmy days of Pioche, when fine bullion could be eeen piled up by tbe tou. The mill bas been steadily rnnning for tbe past two montbs, and will this January show an output of over $120,000, something unprecedented in tbe annals of milling for a ten-stamp mill. If the crushing capacity was adeqnate for the amount of ore that could he extracted per day, the returns would foot np over $500,000 per month.

A Leak.—Last Saturday afternoon, says the *Enterprise*, a small leak occurred in the 12-incb pipe leading to tbe hydraulic pump at tbe Chollar-Norcross-Savage shaft from the big tank on the side of Mount Davidson. The water was turned off and the hole plugged. While the water was shut off, the engines were started up and tbe hydraulic pump kept going. The leak was so emall that it required a plug but half an incb in diameter to fill it. However, had it not been promptly filled, thie hole would have rapidly grown. Sand passing out through such a hole under great pressnre fast eats away the snrrounding iron.

The Pacific Coast Mechanics' Educational Association, a society whose objects will be the diffusion of ussful knowledge pertaining to meohanics, by means of coursss of lectures and the formation of classes for instruction, bas been organized at the University at Berkeley.

Miners' Wages.

Periodically tbs question of tbe reduction of wages on the Comstock comes up for discnssion, tbs plea being eacb time that wages of common minsrs must be reduced in order to make tbe mines pay. In looking nver tbe reports of companiss, it usually strikes us tbat snch items as lsgal expsnses, sundriss, salaries, stc., go to swell ths expenses moro than tbey sbould. If sxpensss are to be reduced—and tbsy should be—ths top-heavy systsm of mining too much in vogue will be best rsmedied by taking off tbe weight from above. A trimming of salaries and rigid inspection of general expenses will serve a bstter purpose than cutting down tbe wages of the men who do the real work. Underground miners get none too much pay for the dangerous and laborious work they do.

Tbere are serious differences of opinion on tbis subject, it is trne; but most psrsons will agree that every effort ought first to he made to prune off the useless or superfluous dependents, and spend tbe money mainly witb tbe producers, before cutting down the bard-earned wages of these men. The Reno *Gazette* brings rather a curious argument to sbow that the mining kings do not care much about the matter. It says: "The situation on the Comstock is becoming snch that a reduction of wages is very londly and gensrally called for. It is usually held that the bonanza firm must make the fight against tbe Union, but we doubt if they care whether wages are high or low, as all the miners deal in etocks, and all their money comes into the bank sooner or later. If wages are high, the men engaged in all the mines on tbe lead have mooey to spend in stocks, and only a part of tbis would be saved to the firm if wages were lower, as they have only balf the mines. The pressure against higb wages must come from the people. They must refuse to pay assessments until they see the mines being run with eome chance for profit. As long as they pour money into the market at tbe top, Mackey and Fair can afford to hold the sack open and catch it as it drops out at tbe bottom."

Miners' State Convention.—Tbe State Miners' Association contemplates, as soon as tbe trial of tbe Gold Rnn case is concluded, to call a convention of the miners of California, to consider ways and msans for the common defense of tbe mining interests and rights. All miners will bs invited to attend, irrespective of tbe character of the mining they are engaged in, as tbe continued and pereistent attacke make upon hydranlic mining are coneidered as placing tbe whole mining iudustry in jeopardy in this State.

Academy of Sciences.

The North Winds.

Tbs regular ssmi-montbly meeting of ths California Acadsmy of Sciences was held on Monday evening, Dr. Behr in the chair. The following were proposed for life membsrs: Walter E. Dsan, John G. Kellogg, A. W. Manning. For resident members, Charles E. Apponyi, Robert G. Hooker and Hsnry Farrar, M. D.

The donations to tbe museum were as follows: From J. H. C. Bonte, cast of a stone implement unsartbed on the University grounds at Berkeley; from Carl Purdy, an Indian pips from Modoc county; also, tusk of n wild boar killed near Ukiah, Mendocino county, Cal.; from Ignatius E. Thayer, pectoral fin or wing of a flying-fish, which flew aboard bark *Annie Johnson;* from T. S. Williams, large bone of a wbale, partially decomposed, and encrusted witb barnacles; from J. A. Richardson, Indian bonee from a cave on McCloud river; from Edward Holland, sea urcbins, found on the mud flats at Wilmington, Cal., or a kind not before observed along the California coast; C. P. Converse, amber from Visalia, Tulare county; Dr. Wm. P. Gibbons, earth or fibrous gypsum spar; Gov. S. Purdy, four specimens of silver ores.

Dr. H. W. Harkness read a paper "On tbe Vegetable Cell, with Some Remarks on its Life History." Tbis paper we sball shortly publish.

In the course of his remarks Dr. Harknsss stated that it was bie opinion that the damage to plsnts done by our northerly winds, was not due to actual desiccation in drying up tbe sap, but to some peculiar electrical condition, wbich arrested the cell growth. Before such nortbers plants sbrivel, curl and show signs of great distress, but with the return of soft, moist magnetic breezes from the equator, they soon resume their fresh and vigorous appearance. Tbese cbanges are far too sudden to bs due to eitber desiccation or absorptioo, but are attributable to a temporary cessation of cell rotation, indnced by electrical disturbances, which we know take place during tbe continuance of our nortberly winds.

Mr. C. D. Gibbes, C. E., remarked tbat when surveying during our north winds, in tbe San Joaquiu valley, the eleotrical distnrbance was eo great as to cause the needle of his compass to fly up against the glass and become nseless during the first part of the day, when in the field; but that if he took the same compass into a warm, moist room, it again acted normally. Engineers in Santa Clara and Calaveras counties report the same action and dip of the magnetic needle during the prevalence of our dry nortbers.

Dr. Harkness said the nortbers affected tbe human ekin. They caused an uneasiness, wbicb results in dog fights, runaway borses, cross dispositions, pallid faces, etc. Dry atmosphere is a perfect non-conductor, but all moist plants and animals, as well as men, then become so many miniature lightning rods. Tbe nervss are at snob times continually irritated by a constant succession of tiny blows, like telegraphic ticks, against the nerve centers. Tbey contract and produce a congestion of the organs; the blood becomes turbid, while kidneys, liver and lungs all suffer.

Dr. Henry Gibbons, Sr., thongbt this electric action more subtle than from any apparent mecbanical evolution of electricity from friction of the passing wind over the surface of the earth. He said all persons felt cold, for it drove the circulation from the surface to the ioterior of tbe body, as Dr. Harkness so beautifully described 20 years ago. Its affect on certain diseases has been marked. The death-rate bas been claimed to increase at such times. He bad a patient whose eyes always blinked and snapped during a north wind, even in a warm, moist room, entirely protected from direct contact with the wind.

Dr. Harkness said we were always surrounded by electricity, but did not perceive it until its equilibrium was destroyed, when it became manifest. In some parts of India silk uoderclothing is necessary to comfort, at certain altitudes, during dry north winds, and in other parts no relief is found in this clothing.

Dr. Kellogg read descriptions of two new plants.

The Effects of Pent-up Gases in Mines.

The peculiar results arising from the liberation of large quantities of gases in mines are amongst the most singular phenomena met with in mining. But whilst we are frequently made acquainted with some of their effects, there are no reliable data as to the cause of the many heavy and sudden issues that take place. It is known that the movement of the column of the barometer was the effect of a cause which must precede such movements, that cause being an increase or decrease of pressure in the atmosphere; and upon the pent-up gas in our coal seams we are taught to believe the pressure plays an all-important part, so that, when the barometer is high, the gas is forced back into the pores and fissures of the coal, and, when the barometer is low, the gas issues in large quantities. But the depression or rise of an inch rarely takes place in a short space of time. Yet, without the slightest indication, a vast volume of gas will escape, filling the working places for a considerable length with gas, which, mixing with the air, however large the quantity, renders it in the highest degree explosive. But what we would more particularly draw attention to is the vagaries of the gas under great pressure, in some instances more than 150 ft. to the square inch. When a sudden discharge takes place, it is sometimes preceded with little noise; at other times there will be a trembling of the floor; it will then heave up; there will be a loud report—probably the rock breaking above. The men, greatly alarmed, rush to the bottom, and the place is entered carefully and examined, and the probability is that the gas will continue to issue—it may be for many days, or even weeks, even when the place it is believed to come from is sunk down to and opened out. In nearly all cases there is a heaving of the floor and a swaying of the roof, so that the two sometimes meet. At one mine in Derbyshire, 1,000 yards of the bank face were lifted up to such an extent that a person could not put his hand between the roof and floor, although the bank face was six feet in hight. The heaving up of the floor, however, shows how great is the force of the gas, coming as it does from a considerable depth, and by which props and iron work are ripped up and twisted. At the Benwell's colliery, in the north of England, at one time, it was not an uncommon thing for the gas to burst from the floor, and throw up vast quantities of stone, the gas having to be piped away.

In a recent case where gas was suddenly given off, a fissure was found both in the floor and roof at an angle of 25°, and for a considerable distance. At the Ryhope collieries in the north of England, a gentleman connected with them has stated, that it was not at all an uncommon thing for him to be thrown off his feet when walking along the face of the coal from the sudden heaving up of the floor, owing to the gas below. At the Pelaw colliery, many years ago, four yards of coal were worked and four yards were left. After a lapse of many years the owners were working the remaining four yards where the coal was considered ungettable when it was originally worked. They found that the floors had been pressed up, and that it was as solid as it possibly could be; that the roof was good and uniform, and that the whole space which had been occupied by the four yards of coal taken away had been filled up by the floor pressing as close as if it had been naturally found so. The probability, however, is that the floor in the case just alluded to was a sort of clay. In many cases the floor has upheaved when the roof has not given away. At one place, where there was an outburst, the staple sunk with the floor to a depth of 14 ft., and about three yards of hard stone had been passed through. Again, water is sometimes found to accompany the gas, and at a colliery in South Yorkshire, the floor was found to rise gradually to the top, and immediately the water got into it, it swelled like lime. In one instance, the level, after an outburst of gas, was flooded with water to a depth of from 18 inches to 2 ft., and the gas and water continued to flow for four days, although no gas or water had been in the place previously.

Perhaps the most singular explosion that has been recorded, is one that took place not very long since in Belgium, in the sinking of a shaft, before the men had reached the coal measures. The men were engaged in sinking, there being a platform for them to work on. They were working in permian strata, when some shots were fired, followed by an explosion, the result causing great displacement of timbering up to 90 yards; and above this point, quantities of stone and sand were thrown open. Upon clearing the debris at the bottom, an unconsumed dynamite cartridge was found. Three out of four men were killed, owing to rupture of the capillary vessels of the lungs through a sudden and violent increase of air pressure. The gas, on analysis, was found to contain no less than 93.47% of nitrogen, and 5.79% of carbonic acid. The probable cause of the explosion seems to be that hollows in the strata immediately above the coal measures were filled with gas given off by the coal, where it was stored up under great pressure, until, in the course of the sinking, the walls of a principal reservoir were sufficiently attenuated as to give way explosively, and after this burst the gas continued to escape for several months through the ground loosened by the first blast. Here the gas was not inflammable, and consequently incapable of causing an explosive mixture, but was comparable to the bursting of a boiler or air receiver under excessive strain.—*London Mining Journal.*

The Ventilation of Long Tunnels.

Herr Wilhelm Pressel has circulated a lithographed paper on this subject among his friends and colleagues; and as it is a question of daily increasing importance, we reproduce his most important suggestions. He begins by pointing out that the direction and intensity of the current of air in a tunnel are the product of numerous factors; that is, the length and dimensions of the tunnel, difference in level of the two mouths, average temperature in the tunnel, temperature of the external air at the mouths, pressure and moisture of the same, direction and strength of the prevailing wind. The effect of the latter group of factors may be either to intensify or to neutralize the natural action of ventilation set up by a difference between the level of the two mouths. The interior of a tunnel situated in a high mountain district, and passing under a vast mass of rock, will always be warmer than the outside air, especially at night, when in the Alps the temperature always falls. The warm internal air will, therefore, ascend the slope, and issue at whichever mouth is highest, and the cool air be drawn in from without to supply its place. Evidently this natural ventilation will be stronger in proportion to the difference of level of the two mouths. But the increase of this difference means increased steepness in the tunnel, and consequently increased production of smoke, and an intensifying of the evil to be cured. Moreover, as was before said, an unfavorable combination of external circumstances may destroy all the benefit to be derived from a steep gradient, and leave only the ill effects. This is the case at the Mont Cenis, where the difference is so great as 140 meters (nearly 460 ft.), but where the natural current is from these causes extremely weak, and often fails to produce any through draft at all, the smoke merely shifting backward and forward, than which nothing can be worse. Nor has the mechanical ventilation succeeded in supplying the deficiencies of the natural. Herr Pressel states that the loss of power in the air-compressing machines is so great that, instead of sweeping out the tunnel, they barely succeed in sending their current sufficiently far into the interior to keep the refuge chambers for the employees clear of smoke; and the apparatus more lately erected for pumping out the vitiated air is very ineffectual. He therefore concludes that natural means are insufficient for the ventilation of long tunnels, and that mechanical means have failed, and proposes instead a system not hitherto tried. It is obvious that a current is caused by varying specific densities of air at various places, the heavier air being drawn along (popularly speaking) to take the place out of which the lighter has arisen. If, then, a distinct difference can be established and maintained between the specific gravities of the air at the two ends of the tunnel, a steady current can be relied upon. This may be done by condensing the air at one end or rarefying it at the other, or doing both together. The second plan has often been adopted. Shafts have been sunk into the tunnel at each end, and the air in one has been kept heated by fires, so that there was a continual indraught of outside air through the other. The objections to this method for long Alpine tunnels are, first, the expense of the apparatus and fuel when used on such a large scale; and, secondly, the radiation of heat from the walls of the tunnel itself, when this is pierced through an immense mass of rock, which makes it necessary that the air brought in should be not only pure but cold. The author proposes therefore to adopt the reverse process, and cool the air in one of the shafts by means of falling water. Railways always approach Alpine tunnels along high valleys, which invariably contain mountain streams of very low temperature. The means of refrigeration are therefore at hand. Herr Pressel considers that a stream of about 100 gallons per second falling through the shaft would cool the air sufficiently and establish the current, for which he believes that a difference of temperature of 10° Cent. between the two shafts would be all that would be necessary. The upper openings of the shaft should be protected by revolving iron shields from the disturbing effects of wind on the ventilation. The mouths of the tunnel should be closed to allow this system to work properly, but need not be absolutely shut. Arrangements should be made for closing the shafts, and either wholly or partially shutting off the water supply, and there should be a special system of telegraphic signals for the purpose, so as to keep the whole system under control and enable it to be worked according to the varying conditions of the atmosphere. In very cold weather the supply shaft should be closed altogether, and the corresponding mouth of the tunnel opened, when the cold air will flow in of its own accord.—*Engineering.*

What is known as the Burgess Ranch Placer case, involving the title to about 23 acres of mining land situated in Shasta county, Cal., has been decided in favor of the applicant, Geo. Simmons. The decision takes the ground that as Simmons had occupied and worked the claim since 1869, he should receive a patent under the statute of limitations of the California mining laws.

All the mines of South America and Mexico, in the palmy days of Potosi, Cerro de Pasco, Cartorce, El Doctor and Pachuca, never furnished as much silver annually as was produced last year by the mines within the United States.

Furnaces vs. Stamps.

The Leadville *Chronicle* says: "The question of the future supply of lead ores is becoming a very serious one for the smelters. At the present time, it is only by increasing the number of furnaces, and thus increasing the proportion of work done to that of fixed expenses, that the smelters manage to make a profit, so sharp is the competition among the six smelters for ore carrying a suitable proportion of lead. If the owners of the Iron mine and the Morning Star should at any time take an idea into their heads to curtail their production, the consequence would be very grave indeed. There was a time in Utah when the smelters worked for nearly three years without making any profit, each expecting to wear out the others, and to secure a monopoly of the market. The indications all around us are that the ores of the future will be more generally milling than smelting ores, and the milling processes possess advantages over the smelting process which all will recognize. A properly constructed mill, managed by a competent man, is less likely to lose money than a smelter, and it ought to be able to handle almost every variety of ore except those which carry so much lead as to be especially adapted to smelting. With the exception of the ores of Red Cliff, most of the ores which are now being discovered in the outlying camps are better adapted to milling than to smelting. It ought to be possible to reduce them in a mill at a moderate expense and with only a moderate loss in the tailings. So many mills, some of them of larger capacity, are now being constructed that improvements in the machinery ought to be of weekly occurrence. If a sufficient number of stamps were set up in and around Leadville, the product of the camp would be much increased, and ores now practically worthless would acquire a mercantile value.

Our Alaska Territory.—Paymaster Kiog and Master Hames, of the United States Navy, published in the Washington *Post* an article taking issue with Prof. Elliott, of the Smithsonian Institute, in regard to the population and resources of Alaska. They say they have been stationed in Alaska for 26 months ending last August, and have personally traversed the whole of the southeastern section, and instead of the total number of white inhabitants of Alaska being only 392, as Elliott asserts, they confidently declare that there are about 500 whites at Harrishurg, 250 at Wrangel, 200 more at Sitka, not including the 250 Russians creoles there who are entitled to be classed as whites, and numbers of others at more than half a dozen smaller settlements where whites are found in companies ranging from 3 to 4 up to 15 and 20. They also say it is the greatest mistake to assert that nothing of value in minerals has been discovered in southeastern Alaska, and add that from Harrisburg settlement, not yet a year old, over $50,000 in gold dust has been sent below, and sales of quartz veins have been made at high figures, with a view of working them next season. Enough has been done to show the great value of the placer ground and exceeding richness of mining of the ledges, and it is certain there will be a large addition to the population next spring. They add: "Further, we know that the agricultural prosperity of that section is rapidly developing, and that the climatic difficulties in the way of it are far from insuperable. Further still, there are now measures on foot to develop the timber interests in one kind, of which the yellow cedar is so valuable and so abundant in Alaska. Neither Washington Ter., Oregon nor British Columbia can compete with Alaska."

South Yuba Tunnel Co.—The tunnel being run by this company at Hoyt's Crossing, on the South Yuba river, is now in some 240 ft. under cover. Work is being pushed rapidly ahead, under the efficient superintendence of Geo. T. Emery, general manager for the company. The tunnel, when completed, will be 900 ft. in length. It is of large size, the dimensions being 14x9 ft. A shaft is being sunk at the upper end, so as to permit of working both ways, and thus hasten its completion. The company contemplate putting in Burleigh drills, but not at present. The object of this tunnel is to divert the channel of the river so as to work out the rich tailings in the river bed. A large flume will connect with the tunnel, and can be extended along the bank for a long distance, thus enabling the company to work out a large portion of the river. It is only about three months since work was commenced, and when it is taken into consideration that much hard granite has been encountered, the company have made good progress. This scheme marks a new era in mining enterprises in this section, and upon its success will perhaps depend the inauguration of others similar to it. It is believed that the project will prove successful, and that the Yuba Tunnel company will be well paid for the investment. All work is being performed systematically and economically, and no money spent needlessly.—*Nevada City Herald.*

Mining is not very brisk in Syskiyou county just at present, the river miners having nearly all pulled out for fear of freshets, and the placer miners unable to work by reason of the cold nights stopping the flow of water for good sluice heads.

Henry A. Jones, brother of Senator John P. Jones, and a resident of the Comstock for many years, died at Virginia City last week.

An Experience for Smelters.

The Leadville *Index* says: People who propose to erect new smelters to treat ores in the outlying camps, can learn a useful lesson in studying the history of the Robinson smelter. These works were erected by the late Lieutenant-Governor Robinson, who devoted considerable time to studying smelters here and elsewhere before he decided on his plan. He consulted everyone whose advice seemed likely to be of use, and it was his hope and calculation that he would have a model smelter. After his death George Daly contributed to the works the knowledge of smelting he had acquired in Nevada and California, and his plans were again improved upon by Thomas Ewing. When the works were complete, the best available talent was secured to run them. Any amount of capital was furnished to secure their success. At the time they passed into the hands of the Robinson company, they had cost $78,000, at which figure they appear as charged in the company's balance sheet. Mr. Ewing, however, had not run them many weeks before he became satisfied that they were a failure and blew out the furnaces. Why? If the Argo works can treat Robinson ore, why could not the Robinson smelter do the like, and save all expense of freight? The answer to this conundrum must be this: Large smelters, buying large quantities of different ores, and accustomed to treat mixtures, can handle ores, which separately are almost too refractory to be reduced. If the additional question be put, why couldn't the Robinson company buy ores to mix with theirs as well as Argo and La Plata, the reader must furnish a reply. As a general rule smart men do one business well, and when they embark in another, they are very apt to make a failure. Local smelters, built to reduce one kind of ore, will generally land where the Robinson smelter is—in silence, dullness and gloom.

Ventilating Tunnels and Mines.—The invention of Mr. A. J. Gonlstone of Tottenham-road consists in constructing a shaft through the arch of the tunnel, and inserting therein a wrought or cast iron pipe or tube, varying in length from 4 ft. to 20 ft. or upwards, of the dimension of 12 inches, or more if necessary, in diameter; the placing of a gas-pipe of small size at the bottom of the aforesaid pipe or tube, from which a constant and continual flow of gas will ascend through the aforesaid pipe or tube, amalgamating with the noxious gases passing through a perforated copper or other metal gauze, or asbestos, or other suitable material, into a funnel or other shaped receptacle, from which it will pass through a coiled cone or other suitable means of transit, above which will be placed two small gas jets continually alight, thus setting fire to and consuming the foul air and gases, burning the same, and rendering them utterly non-deleterious to health. The whole of the upper part of the apparatus to be covered in and hidden from view by a shield of cast iron or other metal in an ornamental style; also the construction of a funnel-shaped zinc or tin collector at the bottom of the aforesaid pipe or tube to facilitate the draft from the tunnel through the pipe or tube before mentioned; likewise, the placing of a wrought or cast iron, or copper or other metal pipe along and immediately underneath the arch of the funnel of such diameter and of such a length as may be necessary to convey the foul air and gases to the aforesaid pipe or tube.—*London Mining Journal.*

Perils of the Lower Levels.—Last Sunday Russell Lamb, brother of Hugh Lamb, of the Bonanza mines, became overheated while at work in the Union Consolidated, and was brought to the surface and taken home suffering from cramps and in quite a dangerous condition. He was still very sick yesterday, but it is thought he will recover. Yesterday morning Philip Horton, working in the Sierra Nevada mine, was brought up from the 2500 level in an insensible condition and taken to his room at the Tahoe House. He was coming out all right at last accounts. It was also reported that a miner was brought out of the Bullion yesterday, who was suffering greatly from having become overheated. Men who have become overheated in the mines not only have terrible cramps, but also had shivering spells, shaking as though with a severe fit of ague. As there are at most of the leading mines bath-rooms well provided with both hot and cold water, about the best thing that could be done with a man who had been overheated would be to put him into a bath-tub filled with water as hot as his skin would bear, and thus at once rid him of his cramps and shiverings.—*Virginia Enterprise.*

The Flagstaff mine, which is on the same mineral belt, and supposed to be on the same vein as the Indiana, Swansea district, Inyo, is now being worked by sinking from the bottom of the old shaft, which is 140 ft. deep. About 20 tons of ore were taken out in sinking the shaft, which averaged 300 ounces of silver per ton.

A Big Nugget.—The Lyon County *Times* of last Saturday says: "Considerable excitement was created in and around Big Pine last week by the finding of a 21-ounce nugget. The fortunate man is a Mr. Cornell. He will give no particulars further than to say that he picked it up in the hills near Fish springs."

MECHANICAL PROGRESS.

American Manganese Ores.

In our last issue, a brief reference was made in this column, in regard to the small attention paid by the American metallurgists, toward utilizing our own rich manganese ores, in the production, at home, of ferro-manganese, which enters so largely into the composition of Bessemer and open-hearth steel. About 30,000 tons of ferro manganese are annually used in this country, of which amount only a very small portion is produced in the United States, while, especially in the Southern States, we have large quantities of the richest of manganese ore. So rich is this ore that it is shipped in large quantities to Europe, where it is worked and returned to this country in a metallic form, to be used in our Bessemer steel works.

Interesting Experiments.

That we can utilize this important item of industry, is fully shown by Willard P. Ward, who communicates to the *American Manufacturer*, the details of some experiments which he has conducted in this direction. The experiments were undertaken in a small charcoal furnace, and under many technical disadvantages, such as inability to heat the blast high enough, lack of sufficient volume and pressure of blast, and, finally, when the difficulties were in a measure overcome, the cracking of the inner and outer walls of the furnace, permitting the escape of the gases which should serve for heating the blast and generating steam. In other words, when a high enough temperature was obtained, the stack itself was not capable of standing it. Before the giving way of the stack the furnace produced about two tons per day of from 50% to 67% ferro-manganese, at a cost of about $50 per ton.

A furnace for the most economical production of ferro-manganese, says Mr. Ward, should be very much larger than the one in which the original experiments were made, and should be provided with all the modern appliances for working a very refractory ore. The amount of fuel required to reduce and smelt one ton of ferro-manganese, of say 60%, would make nearly or quite three tons of foundry iron. Hence the necessity for the best appliances to work with.

In three months' running of my furnace, 58 and a fraction of a per cent. of all the manganese that went into the top of the furnace in the shape of ore, came out at the bottom in the shape of metal. At Terre Noire, 60% of the manganese in the ore is said to be utilized, and 40% lost in the cinder. This seems to be a large loss; but when the very great affinity of the metal for oxygen is considered, it is not excessive. At any rate, if we can do at the start as well as Terré Noire, we may be satisfied. There they employ large furnaces, very hot blast, and coke as fuel. Adopting the same plan and using the same ore, I am satisfied that I can get as good results. In a small furnace, and under the difficulties mentioned, my work did not fall far short of theirs. The ores I employed contain about 45% of metallic manganese, and were smelted with the addition of some iron ore. Nearly three tons of manganese ore would be required to make a ton of 75% ferro-mangenese, utilizing 60% of the contents of manganeee.

The following is an estimate of the cost of producing a ton of 75% ferro-manganese under favorable conditions, such as I have mentioned. It is a very liberal one, and can probably be improved on in practice. At all events, it is large enough to cover everything:

3 tons manganese ore, at $5	$15.00
3 tons coke, at 8 cents per bushel	12.00
1½ tons limestone, at $1	1.50
Labor and superintendence	6.00
Interest at 6% on investment, and repairs	5.00
Total	$39.50

It will be observed that the ore is reckoned to cost $5 per ton; a price at which it can certainly be delivered at the furnace. At the present time ore is exported in large quantities from the Georgia mines to Liverpool and Marseillee, where it commands from $18 to $20 per ton; and as they would not pay us more than they could purchase for from other quarters, we may rest assured that an American company can put into its furnace for $15 what costs from $55 to $60 in England or France. With this advantage, and an import duty of $7 per ton on foreign ferro-manganese, we certainly ought to be able to pay a little more than they for fuel and labor, and still make large profits at present prices. They certainly can not sell much lower, while we would have a large margin.

American ferro-manganese can, without doubt, be made and sold at a fair profit at a price per unit of manganese below that of speigeleisen. When that time comes it will be to the interest of all steel manufacturers, including those working the Bessemer process, to add manganese to their charge in concentrated form, and to recarbonize with some other material than speigeleisen; a plan which is universally admitted by steel men to be perfectly feasible.

THE MOST SERVICEABLE WIND.—A German manufacturer has figured out, mathematically, that in windmills, the most serviceable wind is one that blows at a velocity of 23 ft. a second. The fans of the windmill revolve with nearly double the velocity of the wind. The lowest number of days in the year that the wind is serviceable is 180, in that vicinity, and the greatest number is 280.

Belting Facts and Figures.

Rubber belts drive better than leather, and leather better than unprepared canvas. Wooden pulley faces and those covered with rubber or leather drive better than cast iron. Large pulleys drive better than small ones having same rim speed, because they have longer belt wrap, hence more area of contact. This increase of driving power is not directly proportional to the increase of pulley diameter. Wide belts drive better than narrow ones, because they have wider contact, hence more gripping area. This increase in driving power is not in all cases proportional to the width of belt. The greater the arc of contact the better the drive, because of the increased gripping area. The driving power is not directly proportional to the arc of contact. Double belts will carry more power without being strained than single ones of the same width, but *not* twice as much. The larger the pulley, the greater the proportional increase of driving power of double over single belts. The greater the tension, the greater the driving power, but the driving power is not in direct proportion to the tension. When belt is too slack it flaps and loses driving power by slipping, but the loss of motive power—that is, the fuel or water used—is not as great as the loss of driving power.

Beyond a certain tension it is not desirable to go. Excessive tension, while increasing the power of the belt, causes wear of the journals and bearings, waste of oil and loss of power. The best average practice seems to be 45 lbs. of tension per inch of width of single leather belts. Where there is too little bearing surface, there can be less tension than where there is ample bearing surface of proper character. No kind of oil should be allowed to touch rubber belts. Leather belts are best greased with castor oil.—*United States Miller.*

MALLEABLE IRON, ETC.—M. Forquignon has published an extensive series of researches upon malleable iron and the reheating of steel. Among other conclusions he attaches special importance to the following: 1, Malleable iron always contains amorphous graphite; 2, a casting may lose carbon and yet remain brittle if the original quantity of graphite is not increased; 3, a casting may become malleable without losing any sensible portion of its carbon; 4, if silicium is added to manganesian castings, they are improved by reheating; 5, hydrogen and nitrogen may unite with the carbon of a casting so as to make it malleable without the production of graphite; 6, the breaking load is always more than doubled, sometimes more than quadrupled, by annealing. It increases with the duration of the heating, very rapidly at first, and then very slowly; 7, ductility generally increases with the resistance to breaking, but after a certain limit it has a slight tendency to diminish.—*Ann. de Chim.*

FOR THE PRESERVATION OF BELTS.—*Wood and Iron* gives its readers a recipe for the preservation of belts: Resin oil and 10% of mica. Resin oil will make a belt grip for a little while, and then put a glaze on it, making it necessary for another dose of oil, etc. If it is a leather belt, resin oil will make it stiff and harsh, and cause it to slip and crack. Resin oil is not a "grease," as stated by *Wood and Iron*. It is more of a varnish. It is used to make cheap grades of printers' ink; being ground up with lamp-black in roller mills. Mica is recommended as a lubricant for heavy journals, and has no place on a belt. *Wood and Iron* says that a belt coated with resin oil and mica is not affected by "corrosion," whatever that is. Our Eastern belts never "corrode." Boilers sometimes do. We have known belts to *rot*, but never to "corrode."—*United States Miller.*

WATER IN STEAM.—Herr Stoupler, of Lucerne, Switzerland, by adding fluorescence to the water of a steam boiler, which, by calorometric tests, enables him to detect the presence of one-half of 1% of water carried mechanically out of the boiler by the steam, found that from ¾% to 4% was actually true present in the steam. The deep green color of the water in the boiler was retained in it for weeks, and yet no trace of coloring could be detected in the water condensed in the steam cylinder, a proof that the water which gathers there is entirely due to condensation caused by the expansion of steam, and very little water is actually mechanically carried away by the steam from boilers.

NEW USE FOR SHEET IRON.—An inquiry has been started as to the possibility of using sheet iron as a covering for cotton bales. The present hemp or flax covering is used solely on account of its cheapness; but as it admits moisture and sand, it causes a considerable waste of cotton in the course of transportation. A number of heavy cotton dealers of Memphis, Ky., have written North for quotations on No. 30 sheet iron. If the change should be generally made, it will produce an enormously increased demand for that material. Each bale will require a sheet 76x44 inches, with a weight of 22 lbs. The annual crop of cotton would absorb 66,000 tons of sheet iron.

A NEW AND IMPORTANT CEMENT.—It is said that Dr. Gehring, of Landebut, in Bavaria, by means of an enameling liquid, renders any species of stone or cement harder than granite. The process, it is further reported, admits of being applied to metal, which is completely protected from rust.

SCIENTIFIC PROGRESS.

Wind Pressures.

The wind pressures experienced in India are remarkable. On October 5th, 1864, on the Eastern Bengal railway, two trains were upset during a violent storm. One of these was a train of eight passenger vehicles, and was upset near Echapore. The other was a train of twelve passenger vehicles, and was upset near Arrunghatta. In both cases all the passenger vehicles were blown over on their sides. Besides these carriages, four wagons were blown from a siding at Buggoolelo, and capsized about half a mile north of that station on the same day, from collisions caused by wagons which were started from sidings from the force of the wind. On Sept. 21, 1878, a long train of wagons traveling at about eight miles an hour, on the Eastern Bengal railway, was brought to a standstill by a heavy storm, and was then forced back about a mile with full steam and brake against it; 18 wagons were then detached, but even with half the train it was found difficult to continue the journey. On Nov. 20, 1880, at Negapatano, on the South Indian railway, an empty covered goods wagon was upset by the wind while standing at rest in a siding. Numerous instances have occurred on the Indian railways of trains being stopped, or nearly so, by the force of the wind.

The wind pressures above alluded to are certainly very remarkable for continuous pressures; but in the exceptional cases of tornadoes, such as those which passed over portions of Kansas and other States in that vicinity during the two last seasons, the pressures were far in excess of anything related of India. If the accounts are reliable large animals, such as horses, were lifted completely from the ground and carried long distances in the air; human beings were lifted in the same way and dashed to death. Houses were utterly destroyed to their foundations and their timbers and boards scattered far and wide over the adjacent fields. Electricity doubtless has much to do with the violence of such tornadoes.

USES OF CHLORIDE OF MAGNESIUM.—A German polytechnic journal gives an interesting account of the uses of chloride of magnesium, for which body a patent has been lately obtained as a non-solidifying liquid when subjected to the action of freezing agents. Among several examples, this journal mentions its application in increasing the weight of yarn, this material absorbing large quantities of the liquid. Legal measures have, however, been adopted for the prevention of this proceeding, which, it is hoped, will be successfully suppressed. In Starsfurt the chloride of magnesium, which constitutes the greater part of the waste material of factories, and which formerly was allowed to flow into the passing river, has for a number of years past been used in the preparation of magnesium blocks for the lining of puddling furnaces in the process of dephosphorizing iron. On account of its fireproof qualities it is a much-prized material for this purpose.

PARABOLIC REFLECTING SURFACES.—M. Catchinoff has introduced a very ingenious method of constructing perabolic reflecting surfaces, by applying the principle according to which the surfaces of liquids when revolving about a vertical axis assume a parabolic shape. If a liquid is taken which after some time solidifies, a permanent paraboloid may be obtained. The inventor fixes a semi-spherical basin on a vertical axis capable of being revolved, and pours into the former a sufficient quantity of plaster of paris mixed with water. One of the essential requisites in the process is perfect uniformity of motion, for which reason the use of the steam engine as a source of motive power must be discarded. A small Gramme machine, or a Siemens dynamo-electrical machine will, however, answer the purpose admirably. The liquid used should possess slow solidifying and little contracting properties. Parabolic surfaces constructed in this way may be coated with silver or any other reflecting material, and will be found to yield satisfactory results.

THE PENETRATING POWER OF LIGHT IN WATER.—The limiting depth to which light penetrates in water was some time ago stated to be 40 metres for Lake Leman, by Prof. Forel, who used albumenized paper in his experiments. M. Aeper has recently made similar experiments on the Lake of Zurich by a slightly different method. He used the photographic plates called *emulsion plates* (more sensitive than albumenized paper), and immersed them during the night of August 3d, to depths of 40, 50, 60, 70, 80 and 90 meters. They were brought up after remaining 24 hours in the water, and treated with oxalate of iron. All the plates, without exception, were distinctly affected by the light. Thus the chemical rays penetrate in clear water to at least 90 meters deep.

A DELICATE TEST.—Griess' test for nitrous acid in water is so delicate as to detect one part in 1,000,000,000 of water. The water is acidified, and some anilphanilic acid with some hydrochlorate of naphthylamine added. If nitrous acid is present a rose-red tint is developed.

Tracing the Storms.

The matter of a Signal Service system for the Pacific coast, by which we may be enabled to fix their entrance on this coast and trace their direction, has long been talked of and desired. The prospects are now that the system will soon be inaugurated. Lieut. C. H. Kilbourne has recently returned from a trip north, where he went to select sites for the establishment of the new Service stations, which it is thought that Congress will this winter appropriate funds for. He reports as the result of his observations that the general path of storms upon the Pacific coast is from the west eastward, with a southeasterly trend. The storm center strikes about Victoria, and the southern outer circle of the storm usually strikes Cape Flattery, the most northwestern point on our territory, first. The full force of the storms is felt in British Columbia, where the winds work great ravage. Therefore, a station upon Cape Flattery would give the first indications of approaching storms. For this reason Flattery is chosen as one of the proposed posts. Another station will be established at the mouth of the Columbia or on Tillamook rock.

Another point that the lieutenant is specially instructed to investigate is at Cape Mendocino. The benefit arising from taking observations at those points can hardly be estimated, as the whole system of calculations must be based mainly upon them. There are now but two coast stations—that in this city and the San Diego station. It is thought that in addition to these stations, another will be established at Cape Disappointment. In the event of an appropriation being passed for these stations this winter, an independent coast weather service will be inaugurated here, the observations of which will eventually add much to the general knowledge of the meteorology of the Pacific coast.

EFFECT OF COLORED GLASS ON LIQUIDS.—A German scientific journal recently published an article on the effect of the color of glass bottles on the liquors contained therein, in which the following interesting statements were made: Liquors contained in colorless bottles, when exposed for some time to the light, acquire a disagreeable taste, notwithstanding the fact that they may have been of superior quality before being so treated; liquors contained in brown or green bottles, however, remain unchanged in quality, even if exposed to direct sunlight. This phenomenon has not received proper attention heretofore, and quality has often been sacrificed for the sake of outward appearance. Since the results of the above treatment are due to the chemical action of light, it is advisable to use red, orange, yellow, green or opaque bottles for the preservation of liquors, while colorless, blue and violet ones should be entirely discarded.

SEPARATE SOUNDS ON ONE WIRE.—M. Maiche has found by experiment that sounds of different characters produced from two separate sources can be sent simultaneously on one wire and received seperately. He used at the receiving station two telephones of different resistances, and at the transmitting station caused a musical box to be set going on a microphone of small resistance, while an induction telephone transmitter was spoken into at the same time. The musical sounds were reproduced in the telephone which had the least resistance, and the vocal sounds in the other, so that with the two telephones to the ears the music could be heard by one ear and the speech by the other.

A GREEN METEOR.—The Griffin, Geo., *News*, of a late issue, says: "Some evenings since we saw one of the most wonderful meteors that ever brightened the surrounding hills. It was some time between the hours of 11 and 12 o'clock; we were quietly meandering home from the sanctum, when suddenly a bright rosy light loomed up directly from the southern horizon, and shot with a flash toward the northeast, at an angle of about 70°. When about midway of the heavens the color suddenly changed to a rich green."

WHY GRASS WILL NOT GROW UNDER TREES. M. Paul Bert has shown that green light hinders the development of plants. Plants inclosed in a green glass frame wither and die as though they were in darkness. M. Regnard finds that plants specially require the red rays. If sunlight is deprived of the red rays, the plants soon cease to thrive.

INTERESTING DISCOVERY.—Some fine carvings in ivory, discovered at Nineveh, showed signs of crumbling on arriving in England. Prof. Owen concluded that the decay was caused by loss of albumen in the ivory, and therefore boiled the articles in a solution of albumen. The experiment was a success, and the ivory became as firm and solid as when first entombed.

FREEZING ALCOHOL.—The question has been asked whether it is possible to freeze alcohol, or pure whiskey. Alcohol could doubtless be solidified, but it would require a temperature lower than any yet attained by artificial means.

THE report of the Secretary of the Bald Mountain Mining Company (drift mine), for the month of November shows that the yield of the mine for that month was $6,014.25, while the expenditures were $5,714.75, thus leaving a balance for the stockholders. This is a good start towards declaring a dividend.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Dec. 29.		Week Ending Jan. 5.		Week Ending Jan. 12		Week Ending Jan. 19.	
Alpha	2.60	2	2	....	2	1⅞	1.80	1⅞
Alta	4.05	3.90	4.35	4.15	4½	4.05	1.65	4.10
Andes	85c	80c	80c	70c	80c	55c	1	80c
Albion	1.60	1⅞	1.90	1½	1⅞	1.60	1.90	1⅞
Argenta	....	....	....	....	....	....	....	....
Addenda	....	....	....	....	10c	....	10c	5c
Belcher	1.85	1.60	1.85	1.60	1.55	1.35	1½	1½
Belmont	75c	70c	....	....	65c	2	75c	....
Best & Belcher	7⅞	7½	7⅞	7½	7½	6¾	7⅞	7½
Bullion	1.45	1.35	1.30	1⅛	1.20	85c	1	50c
Bechtel	10c	....	....	....	35c	30c	50c	40c
Belle Isle	....	....	....	....	....	....	10c	....
Bodie	2.90	2.60	2⅜	2.45	2⅛	1	2⅜	2.45
Benton	70c	65c	75c	....	75c	65c	80c	70c
Bulwer	2.70	2.65	2.90	2⅜	2.60	2⅛	2.60	....
Boston	....	....	60c	50c	60c	....	50c	....
Black Hawk	....	....	....	....	....	....	5c	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	5c	....	5c	....	30c	25c	30c	2?c
California	35c	2?c	35c	30c	35c	25c	40c	30c
Challenge	55c	....	60c	....	50c	4?c	6?c	55c
Chollar	1.15	1	1.20	1.05	1.15	85c	1.10	....
Confidence	2.40	2⅛	2⅛	2.05	2.05	2	2	....
Con Imperial	5c	....	5c	....	5c	....	5c	....
Con Virginia	1.35	1	1.10	75c	90c	70c	1½	1
Crown Point	1.10	90c	1.15	1	95c	90c	95c	75c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1½	1.40	1½	1.40	1	80c	95c	90c
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	20c	....
Derbec	....	....	....	....	....	....	1	95c
Day	2⅛	2.15	1.80	....	1.65	1	1	95c
E. Mt. Diablo	....	....	40c	35c	35c	....	....	50c
Eureka Con	13	11⅛	13	12⅛	13	....	1¼	13
Exchequer	1	85c	1	90c	80c	75c	75c	70c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	2.15	2	2.30	1.95	2	1.60	2.20	1.90
Goodshaw	....	20c	10c	25c	....	15c	....	25c
Gould & Curry	4.40	3.60	4.05	....	3⅜	3.65	3.40	4.10
Hale & Norcross	1.80	1.60	1.70	1.40	1.35	1⅛	1.45	1.20
Head Center	40c	....	....	....	....	....	50c	35c
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	10c	5c	10c	....	10c	5c	....	....
Justice	75c	60c	70c	60c	65c	55c	75c	65c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	1¼	60c	....	....	....	....	80c	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	5c	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhtan	2	....	1⅛	1.40	....	....	1½	....
Martin White	2⅜	....	....	....	2⅛	....	2⅜	2⅛
McClinton	....	....	....	....	....	....	....	....
Mono	60c	....	70c	40c	80c	55c	70c	....
Mexican	9⅜	8⅛	10	9⅛	9⅛	8⅜	10⅜	9⅛
Mt. Diblo	7	6⅜	7	6⅛	6⅝	6⅛	8	7⅛
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	25c	....	30c	15c	15c	5c	10c	....
New York	....	....	....	....	....	....	....	....
Northern Belle	8⅛	....	8⅜	8⅛	....	7⅛	8⅜	7⅛
North Noonday	....	....	25c	5c	5c	....	....	....
Navajo	25c	20c	25c	....	30c	25c	50c	40c
Occidental	....	....	1	95c	....	....	....	....
Ophir	6⅜	5⅛	6	5⅜	5⅜	5⅜	6⅛	5⅜
Original Keystone	....	....	....	....	....	....	....	....
Overman	1.45	1⅛	1⅛	1.30	1⅛	95c	1	90c
Oro	20c	15c	20c	15c	15c	10c	1	10c
Paris	....	....	....	....	....	....	....	....
Potosi	1.40	1.35	1⅛	1.40	1.40	1⅛	1⅛	1.35
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	2.05	1⅞	2	1.45	1.40	1⅛	1⅛	1.35
Seg Belcher	....	....	3⅛	....	4.90	....	....	....
Sierra Nevada	9⅜	8⅞	9⅜	8⅛	8	7⅞	8⅛	7⅞
Silver Hill	20c	10c	20c	15c	15c	10c	20c	10c
Silver King	19⅞	19	19⅞	19⅛	19⅜	19⅛	19⅜	19⅛
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	1.20	1.05	1.15	1.05	95c	90c	1	90c
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	20c	....	20c	....	....	....	20c	....
Tioga Con	....	....	10c	....	5c	....	....	....
Tiptop	3⅛	2⅞	4	....	4⅛	4.70	5	4⅛
Tuscarora	....	....	....	....	....	....	....	....
Union Con	15	13⅛	15	13⅛	12⅛	10⅜	11⅛	10⅛
Utah	....	....	6⅜	6	5⅛	5⅛	5⅜	5⅛
Ward	3⅛	....	3⅛	....	3⅛	....	3⅜	....
Wales	75c	....	55c	50c	75c	60c	70c	....
Yellow Jacket	3⅛	3.10	3.40	3.05	3.10	2⅜	2.90	2.60

Sales at S. F. Stock Exchange.

Thursday A.M., Jan. 19.

65 Alpha.....1.55@1⅛
150 Alta.....4.45
150 Andes.....80c
200 Belcher.....1.30@1⅛
250 Bullion.....85c
250 Benton.....75c
445 California.....30@35c
430 Con Virginia.....1.05
650 Crown Point.....75@80c
25 Exchequer.....75c
100 Gould & Curry.....3.80
100 Golden Gate.....2.00
725 Hale & Nor.....1⅛@1.20
1285 Justice.....75c
160 Mexican.....9⅛@9⅜
320 Ophir.....5⅞@6
120 Overman.....1
200 Potosi.....1.45
50 Savage.....1.35
160 Sierra Nevada.....7⅞
240 Silver Hill.....20
870 Union.....10⅜@10⅝
50 Ward.....3⅛
20 Yellow Jacket.....2.60

AFTERNOON SESSION.

175 Belmont.....75@80c
100 Belding.....20c
10 Belle Isle.....10c
530 Bodie.....3⅛
100 Bechtel.....50@45c
60 Bulwer.....2.60
25 C Pacific.....35c
100 E Mt Diablo.....45c
100 Eureka Tunnel.....1.80
350 Goodshaw.....25c
150 Head Center.....75c
50 M White.....2⅛
175 Mt Diablo.....8
30 Northern Belle.....10⅛
100 Navajo.....85c
750 Noonday.....5c
20 Pay Day.....1
20 Syndicate.....15c
100 Summit.....5c

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Horn Silver, Jan. 8th, $15,500; Pascoe, 8th, $1,500; Jay Gonld, 8th, $2,200; Mayflower, 8th, $2,300; Hanauer, 10th, $4 570; Leonore, 8th, $460; Germania, 8th, $1,400; Germania, 11th, $6 400; Pascoe, 11th, $1,450; Horn Silver, 10th, $80,000; Horn Silver, 13th, $27,500; Germania, 13th, $6,500; Hanauer, 13th, $4,550; Germania, 14th, $3,550; Northern Belle, 9th, $4,276; Standard Con., 9th, $35,020; Contention, 9th, $19,556; Star 9th, $2,335; Day, 10th, $6,000; Northern Belle, 11th, $4,308; Bodie, 16th, $6 784; Leeds, 16th, $1,563; Eureka, 9th, $9,826; Silver King, 14th, $17,000; Manhattan, 13th, $41,450.

RICH mineral discoveries have been made eight miles southeast of Wilcox, A. T. The ledge runs nearly east and west, and is reported from 6 to 12 ft. wide. Specimens of ore from this ledge assay from $600 to $12,000. Prospectors are daily arriving at the new district in large numbers. The district has been named Cochise.

MINING SHAREHOLDERS' DIRECTORY.

Compited every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	15	50	Jan 6	Feb 9	Mar 2	W Willis	309 Montgomery st
Alta S M Co	Nevada	22	50	Dec 16	Jan 20	Feb 9	W H Watson	302 Montgomery st
Best & Belcher M Co	Nevada	22	50	Jan 4	Feb 7	Feb 23	Wm Willis	309 Montgomery st
Bodie Con M Co	California	1	50	Dec 6	Jan 24	Feb 23	W H Lent	309 Montgomery st
Bechtel Con M Co	California	8	25	Dec 3	Jan 9	Jan 30	W H Lent	309 Montgomery st
Caledonia S M Co	Nevada	38	25	Dec 6	Jan 7	Jan 26	R Wegener	414 California st
Champion M Co	California	10	25	Jan 12	Feb 20	Mar 13	B Burris	309 Montgomery st
Chollar M Co	Nevada	7	25	Jan 9	Feb 14	Mar 7	W E Dean	309 Montgomery st
Con Imperial M Co	Nevada	17	10	Jan 4	Feb 8	Mar 1	W E Dean	309 Montgomery st
Exchequer M Co	Nevada	18	25	Jan 12	Feb 15	Mar 6	C E Elliot	327 Pine st
Gould & Curry S M Co	Nevada	41	50	Jan 12	Feb 16	Mar 9	A K Durbrow	309 Montgomery st
Hale & Norcross M Co	Nevada	72	75	Dec 21	Jan 25	Feb 16	J F Lightner	309 Montgomery st
Julia Con M Co	Nevada	17	20	Jan 17	Feb 24	Mar 16	H A Charles	419 California st
Kentuck M Co	Nevada	17	30	Nov 23	Jan 3	Jan 23	J W Pew	310 Pine st
Lady Bryan S M Co	Nevada	6	25	Dec 5	Jan 10	Jan 29	C V D Hubbard	310 Pine st
Mono G M Co	California	15	50	Dec 5	Jan 10	Jan 31	W H Lent	309 Montgomery st
Napoleon M Co	California	1	03	Jan 13	Feb 13	Mar 2	H Smith	309 Montgomery st
Navajo M Co	Nevada	15	15	Dec 3	Jan 17	Feb 8	J W Pew	310 Pine st
Noonday M Co	California	5	25	Dec 30	Feb 8	Mar 2	W J Taylor	310 Pine st
North Noonday M Co	California	5	25	Dec 30	Feb 10	Mar 3	W J Taylor	310 Pine st
North Standard G & S M Co	Nevada	3	10	Nov 24	Feb 1	Feb 20	C V D Hubbard	310 Pine st
Original Keystone S M Co	Nevada	6	50	Dec 8	Jan 12	Feb 4	F E Luty	330 Pine st
Overman S M Co	Nevada	52	50	Jan 9	Feb 14	Mar 7	Geo D Edwards	414 California st
Savage M Co	Nevada	49	50	Jan 6	Feb 8	Feb 23	E B Holmes	309 Montgomery st
Seg Belcher M Co	Nevada	20	1 00	Dec 5	Jan 6	Jan 24	G D Edwards	414 California st
Sierra Nevada S M Co	Nevada	71	1 00	Dec 29	Feb 1	Feb 20	E L Parker	309 Montgomery st
Tioga Con M Co	California	15	10	Jan 12	Feb 16	Mar 8	W H Lent	309 Montgomery st
Utah S M Co	Nevada	37	1 00	Jan 14	Feb 17	Mar 7	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	4	03	Dec 27	Jan 30	Feb 17	J M Buffington	309 California
Bay State S M Co	Nevada	1	02	Dec 29	Feb 6	Mar 6	J W Pew	310 Pine st
Butte Creek Hydraulic M Co	California	8	10	Dec 29	Feb 15	Mar 6	A L Taylor	230 Montgomery st
Excelsior Deep Grav M Co	California	17	23	Jan 10	Feb 14	Mar 7	D B Chisholm	327 Pine st
Horseshoe M Co	Arizona	1	02	Nov 30	Jan 4	Jan 23	J H Sayre	330 Pine st
Mayflower M Co	California	10	20	Dec 31	Feb 7	Mar 1	W J Taylor	310 Pine st
Mayflower Grav M Co	California	14	10	Dec 30	Feb 3	Feb 23	J Morizio	323 Montgomery st
McElroy Crav M Co	California	6	10	Dec 20	Jan 24	Feb 11	L Lillie	607 Washington st
Oro M Co	California	11	15	Jan 7	Feb 13	Mar 7	W Stuart	320 Sansome st
Rocky Point M Co	California	10	05	Jan 13	Feb 13	Mar 6	D M Ke t	330 Pine st
Santa Anita M & M Co	California	2	02	Dec 14	Jan 16	Feb 2	J B Titus	24 Kearny st
South Kite G M Co	California	3	10	Jan 9	Feb 16	Mar 7	F A Ferlin	420 Montgomery st
University G M Co	California	10	10	Dec 13	Jan 19	Feb 9	W L Oliver	328 Montgomery st
Vanderhilt M & M Co	Nevada	3	05	Jan 16	Feb 24	Mar 16	J Morizio	328 Montgomery st
Wide Awake Prospecting & M Co	Arizona	15	10	Dec 6	Jan 12	Jan 30	C Hilgebrandt	Chronicle building

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alexander M Co	——	A B Cooper	328 Montgomery st	Annual	Jan 27
Hill side M & M Co	Nevada	F Frankenthal	330 Pine st	Annual	Feb 13
Silver Star M & M Co	——	J W McClung	327 Pine st	Annual	Jan 24
Standard Con M Co	California	W Willis	309 Montgomery st	Annual	Feb 8
Tuscaro a M & M Co	Nevada	F Sperling	309 Montgomery st	Special	Jan 31

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Alexander M Co	——	A B Cooper	328 Montgomery st	2 00	Dec 28
Black Bear Quartz M Co	California	W Letts Oliver	328 Montgomery st	20	Dec 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Jan 12
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Jan 16
Silver King M Co	Arizona	J Nash	315 California st	25	Jan 16
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Jan 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	75 (extra)	Jan 12
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10	Jan 3
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10 (extra)	Jan 3
Western M Co	California	C S Curtiss	309 Montgomery st	75	Dec 22

Mining Share Market.

There is very little of interest in the "Mining Share Market." In fact, the San Francisco Stock Exchange has so little to do that it is considering the feasibility of adding the business of wheat buying and selling to its regular business. Mr. A. H. Lissak, one of the committee appointed by the brokers, on being interviewed by a reporter, says of the scheme: "There is no reason why we should not successfully annex to our business the business of speculating in wheat on the Chicago plan of operation. We are in close business relationship to the speculative element in the city which would take advantage of the opportunities of buying and selling any quantity of wheat, as the probabilities of a decline or fall in the market. It would be a great advantage to the wheat growers, as the business is now conducted by a small number of shippers, who really set their own prices on wheat and buy through agents distributed over the wheat districts. If a properly-organized Wheat Exchange was to be conducted by our Exchange Board, the farmer and grower would have the advantage of open and constant competition. Take the present time, for instance. During the prevalence of this dry weather there are many speculators who would gladly invest on the prospects of a rise on the strength of a dry season and short crop this year. It is too early for me to express an opinion on our probable line of action. But, possibly, if we should report favorably on the proposition of annexing the wheat business to our list, we might devote the morning sessions to mining stocks, and the afternoons to the wheat business. If there is anything in the business, we will, as a Board, probably be able to take care of it. I do not mean to say that there is not ability enough on the Produce Exchange to manage the wheat business, but we have the advantage of experience, the patronage of the speculative element, and possibly the required capital."

Mr. Lissak is a member of the San Francisco Stock Exchange, and also has, through his business associate, Mr. White, a seat and privilege in the Produce Exchange; and, as he has paid some special attention to the business of wheat speculation in this city, his opinion that the Mining Exchange is capable of controlling the wheat business is of special interest.

All work is progressing well at the north end of the Comstock, but the drifts are kept well to the west of the vein, for fear of running into water. Until crosscuts are started into the vein, it is not likely that any move in stocks will be seen.

At the Savage, about the only work being done is on the raise which is being made from the 2400 level to connect with the bottom of the main incline. Upon this work, the whole force of miners is now concentrated. It will not only be a very important connection for the Savage, but also for the Hale & Norcross, and all the other middle mines. Already the work that is being done below is draining off the water that had accumulated in the incline.

The hydraulic pump at the Chollar-Norcross-Savage shaft is now being run by natural flow and pressure of water. It operates so well that no fear is entertained that it will not take care of all the water likely to be sent to it.

The Yellow Jacket folks are drifting into fertile and very promising ground. All the seams and stringers of quartz cut are found to be mineral-bearing, though of low grade. They now have opened up, ready for exploration, a large amount of very interesting ground.

At the Imperial, they are again in shape to do prospecting work, and in crosscutting on the 2300 level have found numerous seams of quartz giving low assays.

THE COPPER REGION.—Henry Praeter, who has been prospecting in the Walker river region for some two months, has returned to this city for supplies. He says he has found a vein of copper ore some eighteen miles north of Wadsworth, on which he is willing to risk more money and more grub. Associated with him is John Harrison, a prospector of experience. Both Mr. Harrison and Mr. Praeter say they have a vein that is perfectly satisfactory and is as rich as they could expect as far down as they have gone upon it. Their vein differs from most of the copper deposits in that region in that it shows native copper from the surface down. They have not met with any heavy masses of native copper, but in going down on the vein they have constantly met with thin sheets of native copper in the seams of the rock. Some of these are very beautiful. Mr. Praeter shows some that are in the shape of oak leaves, others that resemble ferns, and some that have no particular shape. In a seam about six inches in width that follows the footwall they got excellent prospects in free gold. They have panned out as high as four bits to the pound in gold, but this gold does not appear to reach over into the copper part of the vein. In a thin seam against the hanging wall they get good assays in nickel.—*Virginia Enterprise.*

SPEAKING of Mint Director Burchard's report, the Trinity *Journal* says: The total production of Trinity county mines for the year is placed at $326,835, while the amount shipped from Weaverville by Wells, Fargo & Co.'s Express was alone $490,573.84, and which is generally conceded does not represent more than 50% of the actual production of the county.

THE amount of gold dust shipped through the office of Wells, Fargo & Co., at Auburn, for the year 1881, aggregates $281,379.

THE Rye Patch mill, Nevada, a 10-stamp outfit, was burned last week.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

ZEILE.—Amador *Dispatch*, Jan. 14: Most of the workmen at the Zeile mine had a day's rest last Thursday, owing to a break in the Amador canal, which necessitated the shutting down of the mill for the day. Work was resumed as usual in the evening.

KELLY.—We understand that rich rock has recently been struck in the Kelly mine, at Murphy's ridge, and that the indications for a rich mine appear more flattering than ever before. The mill for the mine is being pushed toward completion as fast as the weather and other circumstances will permit.

KENNEDY.—*Ledger*, Jan 14: At this mine there is a little prospecting going on. The mill is running on ore from the old dump-pile.

AROUND VOLCANO.—The Grass Valley hydraulic claim is running full blast, and has been so running for several weeks. The Golden Gate mill has not yet started up. The Downs mine is looking well, as rich in fact as it ever did. The twenty-stamp mill is kept running constantly. The Volcano tunnel company are all ready for active mining, but the water supply is yet too scant to start them going. The Modoc in Pioneer district is taking out rock. The last crushing paid handsomely, and the ore now being extracted looks quite as rich.

SUTTER CREEK.—Amador *Sentinel*, Jan. 11: The Sutter Creek sulphuret works suspended operations on Tuesday last, leaving only two in the county that are working.

CALAVERAS.

LEWIS AND FAIRCHILD MINE.—Calaveras *Chronicle*, Jan. 14th: This mine is one of the finest pieces of mining property in the State. It still continues to yield specimen rock of extraordinary richness, as it has done all along for the past year. In conversation with Mr. E. A. Lewis, one of the owners of the mine, we were informed by that gentleman that from rock crushed in a hand mortar alone, $1,800 had been obtained during the past year. The shafts sunk upon the vein have been carried down to a depth of between 80 and 90 ft and at that depth the developments are of the very best kind. It is the intention, we are informed, to run a tunnel from the gulch, which will not exceed 700 ft in length, and tap the vein at a depth of about 250 ft. By this means the rock can be extracted much more easily and the mine worked to better advantage. A considerable quantity of quartz is on the dump, soon to be milled, all of which will pay handsomely.

EL DORADO.

THE GOPHER-BOWLDER MINE.—*Mountain Democrat*, Jan. 14: They made another clean-up at the Gopher-Bowlder on the 4th instant, and will soon have 10 additional stamps and a rock-breaker in place. The mine is in fine condition for profitable operation. Good connection with the surface at the north end has been made between the new Gopher tunnel and the old incline. A branch from this tunnel makes a semi-circular sweep to the westward, curving to the northward, under the large mass of good ore that was prospected in the old-time workings. This tunnel also has been extended to the extreme northern line of the ledge, securing a large mass of good ore "backing" in that direction. It is safe to say that in the Gopher mine they have opened a body of ore that will keep the 20 stamps going for fully a year without doing any more "dead work." As all of this ore is extracted much more easily and the mine worked to better advantage. A considerable quantity of quartz is on the dump, soon to be milled, all of which will pay handsomely.

SALE.—Georgetown *Gazette*, Jan. 14: "The sale of the "consolidated" mine at Fraser flat for $50,000, and the Wildwood, a few miles east of town, for $7,000, as reported in this paper a few weeks ago, was no sale at all, as we have since learned. Mr. Bilty, of Greenwood, the person who assumed to have brought about the supposed sale, stated to us that such was the case. Our readers at a distance were thus deceived. The *Gazette* had actually lied to them. One party had written to a trusty friend inquiring into the truthfulness of our report. We are endeavoring to confine our reports of mines to facts, and hope hereafter that parties having an ax to grind will not thus impose upon us.

THE Cal. W. & M. Co. have now a force of men at work under Supt. Wolf, putting in a new dam at the head of Bear creek ditch and cleaning out and repairing the ditch from the dam down to Pegleg ranch, a distance of about 8 miles. The increased mining interest of that district demands this improvement.

SNEDER & FORNI have gone to work on their quartz claim, about a mile east of town. Last fall they took out pay until they closed down on account of too much water. They have just put in a water wheel and a pump, and are sinking on the lode. Success to the boys, for they deserve it.

MR. W. C. BAIRD, of the Eureka, arrived Tuesday from San Francisco, where he has been attending to the shipping of the mill, machinery, etc., for the Eureka mine, of this place. One load has arrived, and all will be on the ground this week.

MARIPOSA.

COULTERVILLE.—*Gazette*, Jan. 14: Our mining interests seem to be looking up of late, and as the Marble Spring mill has started up, we expect to hear of good results from that point soon. Mr. Piper, the "bosa" millwright in the southern mines, with a troop of carpenters is now putting up the buildings and machinery at the Black Hill, about 1 mile from this place, and as the machinery was all fitted up before leaving the machine shop, it will require but a few days to complete the job, when we will hear the sound of a steam whistle nearly in sight of our little town. Mr. G. Douglass is still prosecuting the work on the Maxwell creek, or Cook brothers' property, with flattering prospects. The work above here on the Martin & Walling and Bandarita mines is still moving along smoothly and favorably as I understand. There has been quite a number of re-locations since the first of the year, which comprises about all the mining news of this side.

MONO.

BODIE.—*Free Press*, Jan. 14: Without being called upon to record anything of exciting interest this week, it may be said that there is a steady and cheerful activity prevailing throughout the district, and that there is no diminution in the steady output of bullion. At the Red Cloud shaft there was during the last week a very strong flow of water, which is now considerably reduced in volume. The opening of these underground reservoirs of water are incidents to be anticipated at any time in the deeper shafts, and the draining of them is soon accomplished when such splendid facilities as the pumping machinery of the Red Cloud are brought to bear on them. Sinking will be resumed at the Standard shaft, the interruption having been caused by the breaking of the wine bore, which was being replaced by the Bodie foundry when it unfortunately burned down. The station at the 800 level of the Lent shaft has not yet been quite completed, but crosscutting will soon be commenced at that point. An ore dump is being erected at the Lent, which is a matter of some significance. Some very interesting ground is being crosscut at the Tioga mine, in the 982 level.

NEVADA.

HOMEWARD BOUND MINE.—Grass Valley *Union*, Jan. 10: The water in the Homeward Bound shaft was pumped out to a depth of 140 ft in the incline on Saturday last, but in

lowering the column the water gained 12 ft. There was a great deal of water in the flat through which the vein runs, and besides there is considerable ground opened by drifts and stopes, all of which have to be drained, and of course, some time will be necessary for the work. The 11-inch pump is doing its duty well and in due time the mine will be drained to the bottom.

THE NEW YORK.—*Tidings*, Jan. 14: The New York ledge, located on Katu Hayes hill, just west of and adjoining the Pennsylvania, is now being worked with diligence by Jas. Feeny and Jas. Burke, both old and experienced miners. A 20 ft shaft has been sunk on the ledge and a drift has been run 10 ft to the northeast. The ledge in this is from 7 inches to 1 ft in width, and it is estimated that the rock taken out will go about $55 per load, some experienced miners estimating it at $80 per load. There is about 6 tons of ore taken from the ledge, and about the first of next month this will be crushed. Gold is plainly visible in nearly all the rock taken and many of the small pieces are very rich. The location is an old one, having been bought about 12 years ago for $5, and by a New York man by the name of Hopkins. The necessary work had not been done on this mine for some years past and in consequence thereof it was relocated by Jas. Feeny, and work commenced by the above-named parties with the good results. The ledge of the New York is running parallel with the Pennsylvania, now being operated on by the Menlo Co.

PLACER.

IRON FURNACE.—Grass Valley *Union*, Jan. 14: The iron furnace, near Clipper Gap, remains closed down, owing to the bad condition of the roads preventing the hauling of an adequate supply of charcoal to keep the furnace in blast. It is rumored that the company will, in the future, burn coal under its own direction and not by contract as heretofore. It is also again reported that the establishment of a rolling mill near the furnace is contemplated.

PILE-DRIVER.—Placer *Times*, Jan. 14: The Bear river tunnel company have brought up a pile-driver with a hammer of 500 pounds weight, with which to replace the wing-dam across Bear river just above their new tunnel. The support posts put in by hand would not stand, necessitating the present course being taken. The driver was hauled out from Colfax yesterday.

PLUMAS.

GRANITE BASIN.—Plumas *National*, Jan. 14: There are but few men in the Basin now, except those at work for Mr. Mintzel, but the company are hard at it, and will soon be on a paying basis. They have recently finished a raise from the main tunnel and have a house over the shaft. The raise passed through some very rich rock in going up 75 ft, the vein being 5 ft wide in one place, and the free gold showing plainly in the quartz. They have been waiting for some machinery from below, but have concluded to start the mill as soon as they get a furnace done, to heat water for the batteries. The rock-breaker has been running for a few days, so as to fill up the feed-room, and make more room above. Tro Ward, who is in charge of operations, says he has got all the available space filled up and considerable rock broken in the mine which will have to stay there until room is made at the mill. Sec & Jolly have been building a blacksmith shop and timber house, and now they are ready to commence running their tunnel. They have some good rock, about 175 tons at the mill and a large lot on their dump that they did not get hauled this fall. They have a good property.

SIERRA.

FOREST QUEEN.—Work on the Forest Queen ledge has been commenced. They are sinking on the rich ore streak encountered in the tunnel last summer. This ore lies against the hanging wall, and it is hoped that it will widen out as they go down. The gold and copper mining company, located 1¼ miles south of Bassett's, above Sierra City, have a tunnel in 234 ft, with 150 more to run to the pay-chimney where it is down 100 ft below the surface. Ore prospects, on the croppings, from $3 to $9 per ton. Work has been suspended since last July, but will be resumed next month. D. Hollister, J. Williamson, D. Pride and O. Bigelow are the owners of this promising quartz location. Mr. Gilligan is working the old Forest ground at Rock creek, making good wages.

AMERICAN HILL.—A force of men went over to the American hill mine, last week. The Bald Mountain company have washed up their little dump and commenced upon the large one. Work has been temporarily suspended at the Rising Sun gravel claim, Thompson's ranch, Sierra City.

ADVERSE CLAIM.—The Rainbow quartz company have applied for a patent, and the Mammoth company have filed an adverse claim.

VIRGINIA DRIFT MINE.—Sierra *Tribune*, Jan. 11: While in Howland Flat, recently, L. Cross, who is a heavy owner in the Virginia drift mine, and who has leased the property for 1 year, showed us a gold brick valued at $1,500 which was the result of a few days' washing at that claim. The company, which is composed principally of Howland Flat gentlemen, have expended a large amount of money in developing this property, but unfortunately did not succeed in finding extensive pay gravel, but since leasing it Mr. Cross has been successful in opening up some rich ground, and the indications are encouraging for its continuation. Forty men are employed at present, and an average of 200 carloads of gravel are taken out every 24 hours.

STRUCK GRAVEL.—"Doc." Bowere and A. Van Zant, who have been prospecting at Kimberlain ravine, 3 miles from Alleghany, have, we understand, struck fine-looking gravel.

TO PROSPECT THE GRAND PRIZE MINE.—A company composed of Forest City and Downieville parties will, next spring, start a tunnel on the Grand Prize location, situated 3 miles north of Downieville. In order to tap the gravel channel, they expect to run the tunnel in about 2,000 ft. Some of the owners, who are experienced miners, consider this one of the most valuable new locations in the county.

THE RUBY MINE.—The character of the ground in raise No. 2 of the Ruby mine has changed considerably in the past few days, the bedrock now being soft. From authentic sources we learn that the indications for finding gravel soon are very encouraging. They expect to strike the west rim-rock by running the main tunnel ahead a short distance further.

LUCKY HILL DRIFT MINE.—Preparations are being made by the Lucky Hill mining company at Scales diggings to run a tunnel into the ridge, where it is supposed that a rich channel exists. Lumber for the erection of all necessary buildings is on the ground and the work begun. The company will push operations this winter with rapidity.

TRINITY.

MINING PROSPECTS.—Trinity *Journal*, Jan. 14: The outlook for a good mining season in this section is not now so favorable as it was a few weeks ago, yet there is no reason to think it may not prove fully average, or equal that of the past year. Up to this time we have had more waterfall than a year ago, and chances favor heavy spring rains. While the season will not be the best ever experienced here there is reason to hope that it will prove far from the worst. Miners in the several districts of the county are making the best use of what water they have, although the freezing weather of the past week has considerably diminished the supply.

TUOLUMNE.

JOHN ROYAL.—Tuolumne *Independent*, Jan. 14: Work has been resumed on the John Royal mine, Summit Pass. We are informed the parties are extracting from the vein very good ore, which yields handsomely, and they feel much encouraged with the outlook of the mine. Work has also been rapidly pushed forward on the Never Sweat mine, near Bixel's brewery. A new tunnel has been driven in 90 ft, which taps the vein 50 ft in depth. A strike is looked for soon.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Gold Hill *News*, Jan. 16: On the 2700 level the joint California-east drift has been extended 30 ft and the main south drift 15 ft. In the joint Mexican east drift are cutting out a drain and putting in boxes. On the 2900 in the joint Mexican east drift a drain is being cut out and boxes put in. Are repairing the joint California drifts and winzes on the 2700 level. During the week 193 tons of ore were extracted from the croppings and 84 tons and 1500 lbs. sent to the mills. Assays have not been received from the mill.

SIERRA NEVADA.—On the 2500 level the winze in east crosscut No. 2, has been sunk and timbered 9 ft; east crosscut No. 5, has been extended 9 ft; the main north lateral drift 34 ft, and main north drift No. 2, 14 ft. On the 2700 level the joint Union Con. east winze has been sunk and timbered 8 ft.

CALIFORNIA.—On the 1050 and 1750 levels are still clearing out drifts and winzes connecting with the old Con. Virginia shaft.

OVERMAN.—East crosscut has been extended 45 ft; face in the porphyry lying west of the vein. Sutro tunnel drift has been extended 65 ft; total length from point "A" 601 ft. Forman shaft has been sunk and timbered 15 ft; total depth, 2,335 ft.

UNION CON.—On the 2100 level, the main north lateral drift has been extended 20 ft, and the main south lateral drift 30 ft.

CON. VIRGINIA.—On the 1650 and 1750 levels are still clearing out drifts and winze connecting with the old Con. Virginia shaft.

MEXICAN.—On the 2000 level, in the joint Ophir east rift are cutting out a drain and putting in boxes.

GOULD & CURRY AND BEST & BELCHER SHAFT.—The west crosscut has been advanced 52 ft; total length, 574 ft.

UTAH.—On the 2250 level the hoist is completed, and shall commence putting in the boh at once. On the 2500 level the east drift has been advanced 22 ft.

HALE & NORCROSS.—Lowered the water in the 2400 level winze and from the 2500 level have commenced a crosscut west which has been advanced 20 ft during the week.

CON. IMPERIAL.—The east crosscut on the 2850 level is in 120 ft; ground passed through, porphyry with occasional streaks of quartz.

UNION SHAFT.—Are casing timbers at the 2000 station and repairing the 1600 level drain tunnel.

BOLIVIA DISTRICT.

RICH ORE.—*Silver State*, Jan. 11: News has been received here that C W. Gilbert has struck another body of rich ore in the Linda Jo mine, down near Bollvia district. Two or three years ago he shipped some carloads of ore from this mine to Salt Lake, realizing some $0,000 or $8,000 clear of all expenses from each carload. For some time past, until December last, he had not been at work on the mine, and now, after a few weeks work, he has struck another body of ore, from which we hope he will realize a fortune.

BRISTOL DISTRICT.

MAYFLOWER.—Pioche *Record*, Jan 14: Nothing new in regard to our mines has transpired during the week. The ore in the Mayflower mine is growing fabulously rich as depth is attained. It has been fully established that the high-grade ore in Bristol district lies deep.

Now that the snow has arrived the prospectors are afforded a good opportunity for working their claims high up on the mountains. The snow, in places, has drifted to a depth of 4 ft, thus affording an ample supply of water for the men while working.

CANDELARIA DISTRICT.

NORTHERN BELLE.—Candelaria *True Fissure*, Jan. 14: Being so near the timbers in the main shaft, only 1 man could be employed on a shift since sinking was commenced. The progress, therefore, has been necessarily slow. Only 8 ft have been made during the week, the formation being in hard lime rock. The levels above the adit are producing about the usual quantity of ore. The average daily yield of ore is about 52 tons. Bullion shipments for the week ending Jan. 11th, $15,042.19. Shipments on January account to January 11th, $19,211.24.

MOUNT DIABLO.—The winze from the crosscut from the bottom of winze No 1, on the 3d level, has been sunk to a depth of 54 ft, but shows no change. The east drift from wieze No. 3, on the same level, is in 03 ft and shows small bunches of ore in the face assaying $34 per ton. The east drift on the 3d level has advanced 18 ft and has small bunches of ore that assay very high. The stopes above the drift are looking very well and are yielding ore assaye which reach from $80 to $250. The west drift on this level has advanced 9 ft and shows no change. The winze from the west drift on the 2d level is down 78 ft, and the east drift, on this level, has been driven ahead 13 ft. It is now showing bunches of ore assaying from $60 to $103.

PRINCESS.—The work of excavating the shaft for a double compartment was begun on Monday last. Three 8-hour shifts were put on and everything is being pushed to an early completion. At present a windlass is being used for hoisting, but steam will be used as early as practicable.

LUCKY HILL.—Everything about the mine is progressing with the usual vigor. The pump for the boiler froze up at the beginning of the cold weather, but is all right at this time.

CENTRAL DISTRICT.

THE KEYSTONE MINE.—*Silver State*, Jan. 14: Yesterday a 12-mule team belonging to Alex. Wise left here with tools and provisions for the Keystone mine, in Central district. Mr. Wise recently purchased the interest of R. V. Craig in this mine, and he is now preparing to commence work on it. It is opened by an incline to a depth of 175 ft. At a depth of 100 ft a level has been run a distance of 150 ft on the ledge. The ledge is as well defined and regular as it could be, and will average as far as opened 1 ft in thickness, and the ore averages about $100 to the ton. It is estimated that there is at least 150 tons of ore on the dump that will pay well to ship here and work. Six men will be put to work on the mine next week, and the ore will be shipped to the Winnemucca reduction works.

DOWNEYVILLE DISTRICT.

ORE.—Grantsville *Bonanza*, Jan. 14: Work is progressing steadily in the mines at Downeyville with the most flattering results. The ore encountered is of a high grade and new discoveries are frequent. These mines give promise of developing into one of the finest mining properties in Nevada. M. Raphael informed us on Thursday that the furnace started up on Monday and will run steadily for about 40 days, after which it will be closed down for repairs. It is to be hoped that the run will prove a lucrative one to the owners. The future of Downeyville looks bright, and we trust that it will become and continue a prosperous mining camp.

ESMERALDA DISTRICT.

WORK.—Esmeralda *Herald*, Jan. 14: The Centennial is looking as well as usual. There are a number of claims upon which assessment work is being done that show up good ledges. Everything is looking as usual at the Cortez. An upraise was started about 20 ft from the lower tunnel in the drift connecting the tunnel and incline shaft, and a splendid body of rich ore encountered. In other parts of the mine where work is going on good ore is found.

GRANTSVILLE DISTRICT.

THE CENTENNIAL.—*Bonanza*, Jan 11: Work in the Centennial mine is being pushed vigorously. The indications continue favorable for the encountering of an extensive ore body; in fact, it would not surprise us to hear that a rich ore deposit had been cut into at any moment. Mr John Irvine showed us some ore from this mine on Tuesday that looked very promising, no assays having yet been made.

LEWIS DISTRICT.

EAGLE.—Lewis *Herald*, Jan. 11: The tunnel on the Eagle ledge is being driven ahead night and day. But little change has taken place in the character of the ore since last week. Near the south end of the claim a shaft has been sunk 70 ft, in good ore all the way, and the rock piled up on the dump.

STARR-GROVE.—The south drift on the 185 level still holds its own, and considerable ore is being stoped out above this level.

HIGHLAND CHIEF.—The south drift on the Highland Chief, 100 level, is advancing rapidly. Three shifts of men are also sinking the main incline.

MORNING STAR.—The lower level in the Morning Star is looking as well as ever, and opening up a large body of ore for future stoping.

SUN BEAM.—Messrs. Courter & Keay have a force of men opening up the Sun Beam mine. The ledge is large and of good quality.

BETTY O'NEAL.—The sinking pump not having arrived for the Betty O'Neal mine, sinking has been suspended for the present. The shaft has, however, reached a depth of 20 ft below the tank station. The miners are at work stoping out ore from the upper works, and considerable rich ore is being extracted and piled on the dump.

EVENING STAR.—Work is still progressing on the Evening Star with flattering results.

ESTELLA NEVADA.—Considerable work has been done on the Estella Nevada mine during the fall and winter, and men are still at work on the main tunnel.

MOREY DISTRICT.

WORK.—Belmont *Courier*, Jan. 7: There have been no new developments made in the Morey mines during the week, still things are looking as well as ever, and the usual amount of work is being done. The company shipped 2 bars of bullion on the 28th ult., one of which was stamped 927 fine; the other about the same. This mill is running nicely and doing good work. Superintendent Max. E. Bernheimer, feels confident in the belief that Morey is destined to soon become one of the very best bullion-producing camps in Nye county.

PAHRANAGAT DISTRICT.

VALLEY.—Pioche *Record*, Jan. 14: In the near future the Valley Co., whose headquarters are at Cincinnati, will probably resume work on their property in Pahranagat district. We would like to hear of the old mill at Hiko starting up again. It would give the settlers something else to do besides quarreling with each other.

SANTA FE DISTRICT.

IMPORTANT MINING SALE.—Esmeralda *Herald*, Jan. 14: There was recorded this week in the County Recorder's office a deed from Owen and J. T. Bradley to F. M. and B. O. Smith, of the Tip Top, Oulena, Guardian and Truckee mines, one-half of the Aurora and Juniata mines and one-half of the Tremont springs and mill-site, Comstock springs, Sweetwater springs and the Frisco Belle spring. The Bradleys reserve, 10,050 ft in the Truckee and Guardian mine. The properties are situate in Santa Fe district, near Belleville, Esmeralda county. Smith Bros paid in the neighborhood of $20,000, cash down, for the properties. We congratulate our old friend J. T. Bradley on his good fortune. He certainly deserves what he got, for he has struggled hard for years. He asks us to thank those who helped him to prospect his mines by the loan of money, and wants every man to whom he owes a dollar to step up and receive his coin.

TEMPIUTE DISTRICT.

FAVORABLE.—Pioche *Record*, Jan. 14: There are 4 men working in the mines of Tempiute district, and reports from there say they have very favorable showings. Work may be resumed on some of the patented mines of that district next summer.

COLORADO.

NOTES.—*Register-Call*, Jan. 10: Two and one-half cords of ore from the White Cloud mine, in Russel Mining district, treated under stamps at the Randolph and Cashier mills, last week, yielded 20 ounces and 5 pwts. of gold. Under the superintendency of Dr. Henry Paul, the White Cloud mine is being developed in a systematic manner. The smelting iron produced is above the average grade.

HAZELTINE.—Mr. Mellor, of the Hazeltine Mining Co., has written his company regarding the feasibility of adding 2 5-stamp batteries of the new Bulthoff combination mill, to the concentration works of that company, in Willis gulch. It is expected that the pumping apparatus attached to the Hazeltine mine, partially destroyed by the fire of two weeks ago, will be in running order the first of the coming week. The shaft was not so badly damaged as has been reported.

PRIZE.—Bostwick & Co. are sinking a lift of 100 ft in the Prize working shaft, Nevada district. It has attained a depth of nearly 550 ft, but no material change has yet been encountered. A small amount of tribute work in the upper workings is going on. Beverly & Gilbert are working a force of miners in the east level of the Yellow Jacket lode, on Camp Clifford mountain, and are taking out pay.

RARA AVIS.—The Rara Avis Co. have about 60 ft to drive in the tunnel on the vein of the Whitney mine, to make connection with the air shaft. The vein matter, as the tunnel progresses westward, becomes more mineralized, and is being piled up at the mouth of the tunnel, awaiting the completion of the company's concentration mill. Development in the main working or No. 1 shaft is going forward steadily.

IDAHO.

MAYFLOWER.—Wood River *Times*, Jan. 14: Three weeks ago, in referring to a rumor which prevailed that the Mayflower, Jay Gould and Eureka mines, of Bullion, had been sold to Colorado capitalists for $450,000, the *Times* stated as a reason why the report could not be true, that the mines named were owned by as good judges of such property as were in the United States, and that the ground referred to was worth fully twice the sum named. The *Times* is pleased to inform its readers that its view was correct. Only one mine was sold—the Mayflower, and the price agreed upon is $375,000, of which $100,000 has been paid, $50,000 more is to be paid in 15 days, and the balance in June. The purchaser is a Chicago company of which the leading merchant prince, John V. Farwell, is President, and J. T. Cooper, George Clark, Colonel E. A. Wall, and U. S. Marshal Shaughnessy are Trustees. The two last-named gentlemen were the owners of the Mayflower, and will only remain on the Board until all the purchase money is paid. The mine is being turned over to-day to Supt. O. L. Havens, and B. Manford, John Jackson, H. M. Morris and G. L Harris, five gentlemen who arrived from Leadville, Colorado, by Kelton stage, to take charge of the mine for the new owners. It is not reliably known whether, as at first reported, George D. Roberts is interested in the company; but as J. T. Cooper, the gentleman who engineered the sale, operated for years in Leadville in connection with Mr. Roberts, it is very likely that the latter is interested in the new company.

MONTANA.

RETORT M. & M. CO.—*Inter-Mountain*, Jan. 10: The Retort M. & M. Co. was organized under the laws of Montana, with a capital stock of $1,000,000, divided into 20,000 shares of $5 par value each. The company is principally made up of New York and other Eastern capitalists. The company own the Retort group of mines in Cataract mining district, which are on an extension of the Boulder mine. Mr. George G. Hammer, while in New York city, secured through the agency of J. M. Moore & Co., brokers, the capital necessary for the purpose of driving a deep tunnel between the Boulder and Retort mines, both companies joining in the enterprise. The tunnel will be between 1,200 and 1,400 ft in length, and will tap the main vein at a depth of 500 ft. The tunnel will crosscut at least 7 or 8 distinct veins which appear on the surface, and may also encounter some blind ledges. The work of tunneling will be done by machinery, for which purpose an improved air-compressor, a 30-horse-power boiler, 2 improved Ingereoll Eclipse drills, the necessary piping, etc., in all about 30,000 lbs., will be put in position in a short time. John G. Hammer, the superintendent, and N. B. Ringelling have just completed the survey of the tunnel, and ground is now being broken. This development is in accordance with Prof Clayton's suggestions, who is the consulting mining engineer of the company. It is thought that the veins at a depth below water level will carry silver in paying quantities. So far the Boulder Co. have only worked for free gold in the ore. It is estimated 9 months from the time work begins will be sufficient for the completion of the tunnel.

PHILLIPSBURG.—*New Northwest*, Jan. 11: Mining matters in the Flint Creek district continue improvingly onward. Recent developments in the Salmon have exposed in the lowest workings of the No. 2 shaft a large body of very high grade ore, the output per day being from 12 to 15 tons. At the Algonquin the pumps are holding the water to the sump. Nothing new to report of the lower levels. Output of ore about as usual.

AT THE TROUT.—The present depth of the main shaft is 570 ft vertical, the last 100 ft being carried down in the compartments.

THE HOPE mine produces all the mill demands, 15 tons daily. Any amount of good rock on hand. The tunnel to tap the mine from the gulch below is within 20 ft of the vein.

THE GRANITE MINE.—It has more ore in sight, and of better average quality, than can be found in any mine elsewhere in the West.

BELL SMELTER.—*Inter-Mountain*, Jan. 9: At 1 o'clock on Saturday afternoon the Bell Smelter, which has been in process of construction for several months past, was fired up. Not a hitch in any part of the works occurred. Admirable judgement had been used and not a moment's delay was necessary. For the first 12 hours 23 tons of ore were reduced, and for the succeeding 12 hours, 28 tons were put through. At present only one stack is in operation. The matte runs very freely, and is tapped about every eight minutes. It assays 60% copper, and high up in silver.

SALROP PLACER MINE AND FLUME.—Helena *Independent*, Jan. 11: The entire interest of the estate of David P. Fletcher in the Fletcher & Reilly placer mine and bed-rock flume in Nelson gulch, with ditch and water right, being the undivided one third of the entire property, was sold yesterday at administrator's sale to Thomas D. Reilly for $2,900. This is one of the pioneer fluming enterprises of the county, and there are yet many years of profitable work before them.

NEW MEXICO.

SALE OF A VALUABLE MINE.—Bernalillo *News*, Jan. 11: What was threatened to be a prolonged litigation has been transformed by good sense into an ordinary business transaction. The mine held by Robt. Cameron, and claimed by E. C. Chapin to have been jumped by him, has been purchased of Robt. Cameron by Messrs. Chapin, Wright and others.

OREGON.

PIPING.—Jacksonville *Times*, Jan. 13: W. Ludington has charge of Hays & Magruder's mines on Rogue river and is busy piping, having plenty of water.

RAIN.—Much more rain has fallen in the northern portion of the county than in this, and the miners there are all busily at work.

SNOW.—Considerable snow has fallen in the mountains and there is some probability that this will prolong the mining season somewhat.

JOHN HALL has assumed the management of Bybee, Newman & Hawkett's mine, near Waldo. There seems to be some misunderstanding between the partners.

QUARTZ.—Report reaches us, and it seems to be well authenticated, that Green Bros., of Calico creek, are now taking out quartz that will pay $1,000 a ton. We hope it is true.

WATER.—A. W. Presley, of Jump-off Joe precinct, Josephine county, is in town, who informs us that the miners of that section have an abundance of water and are busy.

GALICE.—Frank Eonis and V. Cook returned from Galice creek last Monday. The former informs us that plenty of rain has fallen in that section and the miners are all at work there with full heads of water.

WILLOW SPRINGS.—W. H. Benner, of the Centennial mine in Willow Springs district, informs us that some piping has already been done there and that more ground has already been washed than there was up to this time last year. Mr. Briggs has completed the survey of a water ditch on Wolf creek, which extends from Henry Smith's down Wolf and Grave creeks for some 8 or 10 miles, and will supply water for a large amount of good paying ground. Mr. Morse, the agent of the company hopes to have the ditch finished at an early day, when that place will greatly increase in mining population.

BRUSHY GULCH.—John Lewman and Wm. Farrie are working their quartz ledge on Brushy gulch, in the vicinity of Applegate, with promising results. They have sunk down over 20 ft and their ledge is about a foot wide, with an abundance of good quartz in sight. Gold can easily be seen in the ore with the naked eye, and the owners are now engaged in grinding some of it.

UTAH.

THE MUSCATUN CROUP.—Salt Lake *Tribune*, Jan. 14: These mines are being worked again, this time by Flaull & Co.

THE GREAT BASIN.—The main incline is being sunk down through the pyrites, under contract with the expectation of finding rich ore below.

THE JASPER AND CRANGER.—The work recently done on these properties under the direction of S. D. Davie shows indications of another large ore body.

THE QUEEN OF THE HILLS.—The prids of the old Chicago Co., now owned by the Flavilla M. Co. has resumed shipments under lease to S. D. Davie

THE AGENT.—A good mine owned by the Norris S. M. Co. has become involved by bad and inexperienced management and is advertised for sale on Jan. 23d by the U. S. Marshal.

BULL VALLEY MINES.—Silver Reef *Miner*, Jan. 9: Gen. Pace has a force of men working on his mines in Bull Valley district, some of which are looking very well. Samples recently sent to St. George gave very promising results in silver. Ten miles north in Damon valley, two parties are at work sinking shafts upon recent locations. It will be remembered that about a year ago parties prospecting in the localities named found traces of old smelting works, which conforms to the report that more than a century ago the Spaniards, in their northern explorations, discovered mineral there, and erected reduction works, which they as far as possible obliterated when they passed on. Traces of previous mining have also been found in these localities.

THE HORN SILVER CO. has a large force of men employed in the mine. They are determined to outstrip the record of the previous year three-fold. Their smelters at Franklyn and Frisco are all in prime order and dividends of magnitude will be forthcoming.

LULU.—Work on the Lulu is still progressing. The formation, so far, has changed but little. This company started to sink, and sink they will, several hundred ft, if necessary, before crosscutting.

MILL.—We learn the mill now in course of erection on the Copper Belt mine, at Marysvale, is about completed, and a successful run on the ores from the famous Deer Trail and Copper Belt mine is anticipated. Much credit is due Messrs. Lovett and McCorkindale for their enterprise in pushing the pioneer mill of that promising district.

BEAVER LAKE.—The O. K. copper mine in Beaver Lake mining district, is down on the footwall a little over 30 ft on a very fine quality of ore. At a depth of 75 ft a crosscut at right angles through the vein has been run about 60 ft on ore.

THE Foreman shaft is down 2,328 feet and is being sunk and timbered at the rate of 10 feet per week. The drift to connect with the Sutro tunnel is in 660 feet from a point 200 feet west of the shaft. Connection will be made early next month.

The Public Lands.

How to Make Known Our Vacant Lands.

Hon. B. B. Redding has in the January *Californian* a very valuable article on "Immigration, and How to Promots It." It is a straightforward letter of advics from one who has had almost a score of years' experience in public land matters in this State, as to the way to give practical aid to new comers who are in search of lands for homes. We are obliged to content onrselves with extracts from the article, having chosen them with an idea of showing our readers the steps which are necessary to take to find out what land is still open for settlement in any part of the State which they may wish to examine. We qnote from the *Californian* as follows:

The man who comes to find a piece of public land for a farm, that he can pre-empt or homestead, wants definite information. He wants to know where he can find, at first cost, a piece of land of 80 or 160 acres, npon which he can raise wheat, grapes, or other crops, and thereby support himself and family. Any bureau of immigration that fails to furnish this information has no reason for living; is not worthy of support, and should die. It is popularly supposed that this kind of information can be obtained at the United States or State land offices. This is only true in a general sense. The basis of the information is to be found there; but it is distributed through perhaps 50 volumes of 400 pages each; and the United States does not find clerks to collate and classify this information. It surveys the land, furnishes a record of the quality of so much of it as is passed over by the surveyor—whether level, timbered or rocky—and opens thee books to public inspection, and says, *caveat emptor*. If the immigrant goes to the land office, and says he desires to pre-empt a piece of land, the clerk immediately answers, where? It is not the clerk's business to find him the land, or to direct him to land he, the clerk, has never seen. The clerk will show him the books and maps, and allow him to make a selection; but, unless more than ordinarily intelligent, can only answer generally as to the climate, rainfall, or productions of the region in which the immigrant proposes to make a selection. If California was similar to Kansas and Nebraska, with thousands of square miles of prairie of almost uniform character and climate, the clerk could hardly direct the immigrant amiss; but California is peculiar. Generally, the most valuable agricultural portion of it may be described as a series of large valleys, running northwest and southeast, between two ranges of mountains. Some places at the north end receive nearly 100 inches of rain annually; other places in the same valley, not to exceed five inches. There is also a great difference in the rainfall between the east and west sides of the valleys, at the same elevation. There are also local differences; as for illustration: There are vacant Government lands in the San Francisco land district, in township four south, of ranges three and five east. If the immigrant selected his pre-emption in four south, three east, his land would receive an annual average of 18 inches of rain. If he selected it 15 miles farther east, in four south, and five east, his farm would receive not to exceed eight inches, and his crops of wheat would be failures four years out of five. He would find, by practical experience, that the Mt. Diablo range of hills, lying west of his farm, stripped the moisture from the clouds before they passed over his land. It is not the business of the clerks in the Government land offices to devote their evenings to the study of the meteorology of the State; nor to expend their salaries of $100 a month in examining lands, and estimating their agricultural possibilities, for the benefit of immigrants or the public. This is the work of the State, through a geological survey; and is not, in new States, usually undertaken and completed until public schools and universities have not only been planted, but have grown and borne fruit.

All the information necessary for the immigrant or settler can be procured, and can be exhibited to him, with such certainty and clearness, that, if he has positive ideas as to the kind of agriculture in which he proposes to engage, he can be directed to particular townships, containing public lands from which to make his selection. The business of obtaining and collating this class of information is in the hands of men who, from natural aptitude and opportunity, have been compelled to make the subject a study. A very excellent clerk or book-keeper might make a very poor searcher of records.

The gathering and publication of this information, as the only practical means of promoting a healthy immigration of agriculturists, should be under the direction of a bureau created by the State. This bureau should act under authority of law, not because the State, as a rule, does work as well or as economically as individuals, but because what is published by the State goes out as official, and has a weight and unquestioned influence in the countries from whence our immigrants come that are not accorded to the publications of individuals or corporations.

To direct and aid this class of immigrants, the Board of Trade of San Francisco has appointed a committee of gentlemen, who, without doubt, are unselfish, sincere, and earnest. It is very desirable that the work of this committee should result in fruition. Many of the members have possibly no more than a general knowledge of the laws of the United States and the rules and regulations of the United States Land Department, governing the survey and disposal of the public lands. It is not therefore, improper to show plainly what is necessary or requisite before this or any other committee or bureau could do effective and practical work in directing the farming immigrant where he may find desirable public land on which to make a home. It may also be added, that the system here proposed is not theoretical, but founded upon practical experience during the past 18 years.

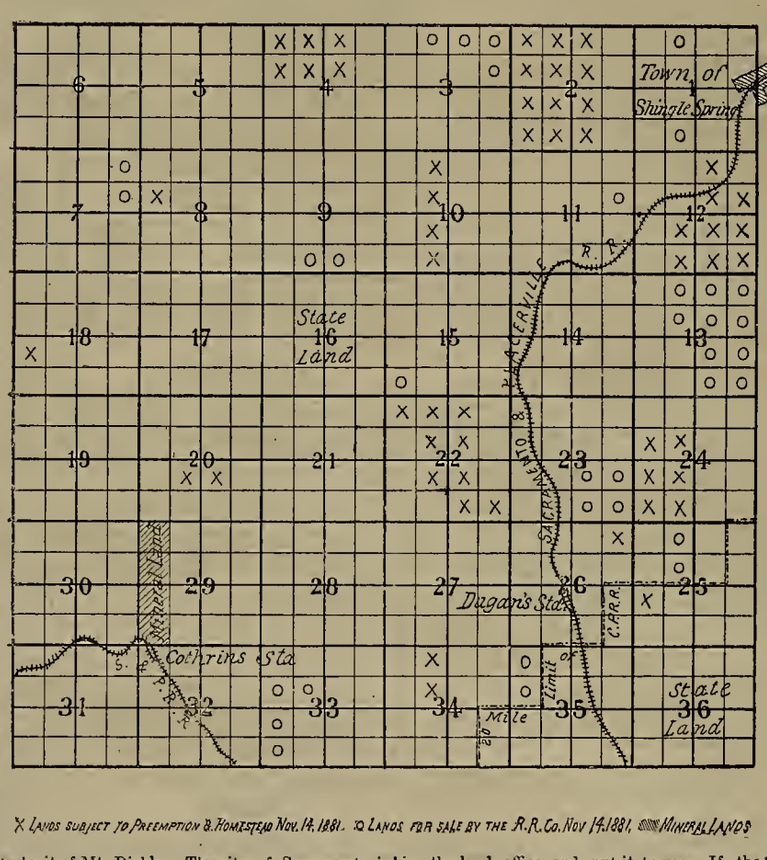
The public lands of the United States are first surveyed into blocks six miles square; these are called townships. These townships are numbered north, south, east, and west, from some prominent central point. In the northern part of the State this point is the summit of Mt. Diablo. The city of Sacramento is in township eight north, of range four east, therefore, it is in that particular township which is 48 miles north, and 24 miles east, of Mt. Diablo. These townships are subdivided into 36 sections, each a mile square, and systematically numbered. Each section again into quarter-sections of 160 acres each; and theoretically, these again into 40-acre tracts, which is practically the smallest subdivision with which the Government deals. This system is definite, and avoids any confusion. It enables tho intending settler to find a given piece of land, and assures positiveness and clearness of description in patents and deeds. A conveyance of the southeast quarter of the northeast quarter of section 17, township 10 north, of range eight east, Mt. Diablo base and meridian, gives a clear and positive description of a certain and particular 40 acres of the earth's surface, which cannot be made to apply to any other 40 acres on this planet.

When a township is surveyed and subdivided, a map of it is made, and filed in the local United States land office. Any settler who may be living on the land in this township has now the preferred right, for 90 days, to file, in this land office, his claims of pre-emption or homestead for 160 acres, which must embrace the land where his house and other improvements are situated. The cost of filing a pre-emption claim is $3. The Government requires the settler to occupy and improve the land, and gives him a credit of two years and nine months within which to make his payment. He should, before the expiration of this period, appear at the land office, with two witnesses, and prove to the officers that he has lived on and cultivated the land, when he is allowed to pay for it, at the rate of $1.25 per acre, if outside of the limits of the grant of odd-numbered sections made by the Government to aid in building a railroad; or $2.50 cents per acre, if within those limits. After this is done, the Government issues to him a patent for the land. If the settler so elects, he may file a homestead for 160 acres. The fees in this case, if without the limits of a grant to a railroad company, are $16; or $22, if within such limits. The settler in this case is required to reside upon and cultivate the land for at least five years, after which he can appear, at any time within two years thereafter, with two witnesses, before the land office, and prove the facts of his residence and cultivation, when the United States Government will give him a patent without further cost, except an additional fee of $6, if the land is beyond railroad limits; or $12, if within such limits. There are other means of obtaining lands from the Government, such as State selections, university locations, etc.; but these do not interest the immigrant bureau, or the intending settler.

All of the land in the township not thus appropriated by the settlers who were living upon it at the time of the survey is subject to pre-emption and homestead, in 160 acre tracts, by the first settler who will occupy it, file upon it in the land office, and put it to use. If the township is within the limits of a grant to a railroad company, then only the vacant quarter-sections of even numbered sections are thus subject to pre-emption and homestead. The odd numbered sections can only be obtained by purchase from the railroad company.

The practical business of a bureau of committee on immigration is: First, to obtain the information where, in this State, may be found public land of the Government, of average quality, that is subject to pre-emption and homestead. Second, to have this information put upon maps, and kept in charge of an intelligent clerk, who has a sufficient knowledge of the State, its climate, and productions, to enable him to explain to an immigrant how it may be found and examined; and generally, the productions, climate, rainfall, and market facilities of each particular region. Third, the publication and distribution of a pamphlet, giving the obtainable statistics of the productions of the State, and its exports; the character of country; its peculiarities of climate; its rivers and railroad system; its common school system; and generally, such other facts as would give a stranger a correct view of California and its people. The publication should also state that there remained, of public lands, on the day of the publication of the pamphlet, as many millions of acres as may be found; that these lands are unappropriated, and are subject to pre-emption and homestead, in tracts of 160 acres, by any immigrant who desires them. It should further state that the immigrant bureau will have on exhibition maps showing these lands, and a person in daily attendance to explain to the immigrant how they may be found; and further, that no fee will be charged for giving this information. If possible, the correctness of the facts stated in the pamphlet should be indorsed by the British, German, Swedish, Norwegian, and other Consuls, as well as by the Governor of the State. If these three things were done, in a very short time the question of immigration would be solved. We need but show the members of the dissatisfied classes of the East and Europe where they can obtain fair lands, at Government prices, or practically without cost, and they will find the way to come and take them.

If the bureau obtains this information, and simply gives public notice that it will, without cost, direct agricultural immigrants where they may find public land suitable for cultivation, and supply skeleton maps, showing these lands in a given township in detail, it may, in my opinion, cease further work or expenditure. The various transportation companies will, in their own interest, take the necessary measures to bring people to the State. To illustrate how simply and easily this information can be gathered by the bureau, and with what clearness and directness it can be exhibited to the immigrant, I have selected a township at random—township 9 north, of range 9 east, Mt. Diablo base and meridian; that is, that township which is 54 miles north and 54 miles east of Mt. Diablo. A map of the State shows it to be in the Sacramento United States land district, a part within and a part without the limits of the grant to the Central Pacific Railroad company; and that all of it is in the "foothills" of the Sierra, and within the county of El Dorado. The State map also shows that the Sacramento and Placerville railroad passes through it. A letter to the land office at Sacramento, asking what lands had been filed on by settlers, or disposed of by the United States in this township, and an inquiry at the railroad land office as to the patented and unsold lands belonging to the company in the same township, were both promptly answered. From these answers, the accompanying map has been constructed, showing all of the land in this township subject to homestead and pre-emption on the 14th of November, 1881; and also showing the lands which the railroad company, in the same township, had for sale on the same day.


Township No. 9 North
Range No. 9 East Mt Diablo Meridian.
Town of Shingle Springs
State Land
Placerville
Sacramento
Cosumnes R.
Cothrins Sta
Dugan's Sta
Limit of 6 Mile
State Land
X Lands subject to Preemption & Homestead Nov. 14, 1881. O Lands for sale by the R.R. Co. Nov 14, 1881. Mineral Lands

This map shows that there are, to-day, in this township 2,120 acres of United States land undisposed of, and subject to pre-emption and homestead; and also, 1,320 acres belonging to the railroad company and for sale. To ascertain the general quality of this land, the office of the U. S. Surveyor-General was visited, and from the field notes of the United States deputy surveyor I made the following extract:

"The land in this township is generally hilly; it is intersected by several streams, toward the heads of which are fertile valleys. There are several vineyards in different parts of the township, which produce a good quality of wine. Toward the northern part are hills, destitute of timber and covered with chemisal and manzanita brush, which are capable of being converted into good vineyards. This township formerly contained rich deposits of gold; and the numerous creeks and ravines have been thoroughly mined. At present, there are, with few exceptions, no mines which are remunerative to white labor. Copper has been sought after in different parts of this township, but with no encouraging results. The Boston Copper M. Co. has worked for three years, and has sunk several shafts in the center of the township, but without much success. In the southwest quarter of section eight, and northwest quarter of section seventeen, are limekilns and marble quarries, from which a good quality of lime and marble are procured. The timber is generally white and live oak, and pine, with undergrowth of chaparal, chemisal, livecak, manzanita, and huckeye. The township is well watered, and has good facilities for communication afforded by the different toll roads and the Sacramento and Placerville railroad."

The survey of the Sacramento and Placerville railroad shows that the land in this township has an elevation above the sea of an average of nine hundred feet. The lowest portion of the township, over which the railroad passes, is 453 ft.; and the highest, 1,425 ft. It is, therefore, within what is known as the warm belt of the "foothills." The meteorological records kept by the Central Pacific railroad company show that for the past seven years this township has received an annual average rainfall of 32.61 inches.

With a copy of this map, and the information here detailed, an immigrant could have no trouble in visiting this township, and making an examination of the vacant lands. He would, without doubt, find many tracts within the inclosure of people who, having exhausted their own free pre-emption and homestead rights, are desirous of retaining the use of adjoining valuable public land as long as possible; but they will generally yield possession when a filing is made in the United States land office.

From personal knowledge and cursory examination of the records, I am convinced there are, on the plains east of the Sacramento and San Joaquin rivers, and in the "foothills" of the Sierra, below an elevation of 2,000 ft., more than 2,000,000 acres of wheat, orchard and vineyard land subject to pre-emption and homestead.

In taking this township to use for the purpose of illustrating how the vacant lands are to be found and exhibited to the immigrant, I happened upon one quite thickly settled, where there are schools and places of worship, wheat farms, orchards and vineyards—in fact, one of the most noted vineyards in the State is in this township. If I had taken, for purpose of illustration, a township farther away from a railroad, it would have disclosed larger bodies of public land.

The Engineer.

Engineering Progress for 1881.

It is well at the threshold of a new year to look back at the achievements of labor, discovery, invention and the like, and make note of that which will give to the year its historic character. We condense from the *Scientific American* a brief reference to the progress which has been made during the past year in the matter of engineering, from which it appears, that although it has not been the best of years, 1881 will not go down to history as an empty or a bad one.

In New York, the lighting of streets and squares by electric lamps was begun less than a year ago. The work of putting down mains for the conveyance of electric conductors for a general system of incandescent electric lighting for stores, offices and dwellings is going on rapidly. And the same may be said of mains for steam heating from central stations.

The great bridge across the East river is nearing completion. The year has seen the approaches substantially finished and work on the superstructure begun. The original plans have been materially changed during the year, making the bridge five feet wider and four feet higher, with greatly increased strength, to enable it to carry railway trains of Pullman cars.

The tunnel under the Hudson is progressing rapidly and securely by improved methods, work going on from both shores. Steady progress is also making in the excavations under Hell Gate for the removal of Flood rock.

In marine engineering the most notable progress has been seen in the building of steamships exceeding 5,000 tons and up to 8,000 tons, and in the substitution of steel for iron, as in the construction of the *Servia*. On the destructive side we have seen the successful testing of the Ericsson torpedo boat, *Destroyer*, the less successful testing of the *Alarm*, and the launching of some notable torpedo boats in England.

Besides the work of civil engineering already noticed are several more or less important ones, begun or completed, which should not be forgotten. Another line of railway communication across the great West has been completed in the Southern Pacific road, and rapid progress has been made toward the completion of the Northern Pacific.

Our southern neighbor, Mexico, has manifested unwonted activity in railway extension, and unwonted wisdom in greeting cordially American enterprise therein, and in the Tehuantepec ship railway scheme of Capt. Eads. At Panama, the De Lesseps canal project has been seriously begun; surveys and some excavations have been made, and a small army of laborers employed. The St. Gothard tunnel, through the Alps, has been opened to traffic, and the projectors of the English channel tunnel have given earnest of their sincerity in steady and promising work in actual drifting under the sea.

Not the least notable characteristic feature of the year has been the increasing attention given to useful applications of electricity, due partly to rapid advances in electric lighting, but more, perhaps, to the prominence given to electrical affairs by the successful exhibition at Paris. The storage of electricity, so-called, though not new, has been greatly developed and improved during the year. From being a laboratory experiment known to few, it has risen to be a promising factor in the practical application of electricity to every-day affairs. The electric railway has been extensively tested on the continent, and ground has been broken for a commercial electric railway in Ireland. The system of telephonic stations for civic purposes begun in Chicago, has been much extended, adding materially to the efficiency of the police system.

The Fast Steamer Line.—It is stated that all the needed capital has been raised for Mr. Jacob Lorillard's proposed express passenger line of steamers between New York and England, by which it is intended to make the trip from port to port in six days, thus effecting an important saving of time over the present ocean voyages. By this line the ships will not come into New York harbor, but will land on the extreme eastern end of Long Island, where there is a deep natural harbor. The Long Island railroad will be extended to this point, which is about 100 miles from New York, and passengers will be saved the long and tedious voyage past Long Island and through the Narrows up to the city. The harbor on the eastern side will be Milford Haven, whence quick transit to London will be given by rail. The vessels to be built for the new line are to cost between $1,500,000 and $2,000,000 each, or some 50% more, it is said, than any vessel heretofore launched, and as it is intended to make the line purely American, they will probably be built on the Delaware. When the voyage from America to Great Britain can be made in six days, instead of requiring from ten to fourteen, as now, travel to and from Europe will vastly increase.

Light from Wave Power.—An iron buoy, fitted with apparatus, intended to convert the power of wave motion into electricity, which will, in turn, supply an electric light, has been anchored in the lower bay outside of New York harbor.

A large number of new mines will be opened up the coming spring to swell Utah's mineral production.

Useful Information.

To Design a Monogram.

Scarcely anything seems so easy as to design a monogram, yet we see very few successful ones, the most of them being a mass of mixed-up letters and ornament of which we can find neither the beginning nor the end. There is a law regulating the designing of everything, and it is this law which the true designer keeps in mind and applies to his work; the effects of obedience to this law and its violation are seen as clearly in the design for a monogram as in the design for a cathedral.

First, there should be harmony of composition—that is, the letters should so emphasize, subdue, or control each other that the composition should impress us as compact, appropriate, and, being so, beautiful.

Second, there should be no unnecessary ornamentation; there should be a quiet and peace about the design which will always please the truly artistic. Looking at some designs, we get the impression that ornament was so plentiful that the designer saw no other means of consumption than that of burying his designs in it, for we see that there is a mass of curves, angles, shades and leaves, but nothing else.

Third, simplicity of lettering is an important requisite, as there should be no possibility of mistaking an E for a G or C, and the boundaries or outlines of the letters should be well defined.

Fourth, the order of sequence of the letters should be carefully attended to.

The common idea is, that a certain number of letters are given with which to make a pleasing design, and so far, that impression is right; but there is something beyond this. There is the art of so placing the letters that one can distinguish at a glance the first, the central and the last letter. Now the rule to be observed to secure this result is as follows: The *last* letter of the monogram must be the principal feature, and must be the largest, the boldest and the heaviest letter; then the *first* letter must be the next in size, but the lightest in outline and color; then the *central* letter must be the smallest and of an intermediate tint. If the monogram is of four letters, the two intermediate must be the same size and the second letter lighter in outline and color than the third.—*Art Amateur.*

Cleaning Brass.—The government receipt for cleaning brass, used in the arsenals, is said to be as follows: Make a mixture of one part common nitric acid and one-half part sulphuric acid in a stone jar; then place ready a pail of fresh water and a box of sawdust. Dip the articles to be cleaned in the acid, then remove them into the water, after which rub them with sawdust. This immediately changes them to a brilliant color. If the brass is greasy, it must be first dipped in a strong solution of potash and soda in warm water; this cuts the grease so that the acid has power to act. The *Manufacturer* says that rusted steel can be cleaned by washing with a solution of half an ounce of cyanide of potassium in two ounces of water, and then brushing with a paste composed of half an ounce of cyanide of potassium, half an ounce of castile soap, an ounce of whiting and sufficient water to make the paste.

To make quickly-drying polish or varnish to be applied to small turned articles while in the lathe, with a hard and glossy surface, dissolve ten ounces of shellac in one gallon of wine spirit by gently heating over a water bath and stirring. Let it stand for several days in a covered vessel, then draw off the clear portion from any sediment, for use. For ebonizing articles of this kind, put the wood for about half an hour into a hot solution of one ounce of logwood extract in a quart of water, and then transfer to a warm solution of one pound of copperas in a gallon of soft water, and let it remain in this bath for several hours. Give the pieces a second dip in the logwood and iron liquors, then rinse and dry.

To Make a Good Cologne.—Take alcohol 95%, 1 quart; oil of cedrat, 9 drams; oil of thyme, 2 drams; oils of bergamot and lemon, 6 drams; oil of Portugal, 4 drams; oils of neroli, vervain and rosemary, 2 drams; oil of mint, 2½ drams; eau de melisse, 2 drams; tincture of musk, 24 drops. Mix, and after standing 24 hours, filter till clear.

Removal of Strong Odors.—It is said that ground mustard is an excellent agent for cleansing the hands after handling odorous substances, such as cod-liver oil, musk, valerianic acid and its salts. Scale pans and vessels of various kinds, may also be readily freed from odor by the same substance.

Sheet zinc is largely used for ceilings in Germany, especially where the beams of the upper floor are made of iron. The use of wood is entirely dispensed with, and excellent decorative effects are produced by stamping, painting and gilding, or bronzing a part of the ornaments.

Improving the Mississippi.—The Mississippi valley members of Congress will meet soon to consider the improvement of the Mississippi. They say that they are determined to have an appropriation this season, and are all in accord.

The Match Business.

It may not be generally known, yet it is nevertheless a fact, that a monopoly exists in the match-making business at the East as fully equipped and as well organized as that of the Standard Oil Company. There may be more money invested and larger profits growing out of the latter, but the monopoly of the former is not less perfectly organized.

The head office of this mammoth match-making concern is in New Haven, Conn., and it is said to have but a single important opposition—a factory at Trenton, N. J. The company has 15 factories in operation, scattered throughout the Eastern, Middle and Western States. It is well supplied with the most perfect labor-saving machinery, by which it is enabled to perform its vast labor by the aid of only about 3,000 hands in all its factories.

In one room in one of the two factories at St. Louis there is $12,000 worth of machinery used for the making of paper boxes. The whole process is mechanical. At Akron, O., where probably the largest factory is located, the machinery is so perfected that one might say a tree is put in one end of a machine and it comes out matches at the other. The company has about $5,000,000 invested in machinery and buildings.

What is the annual yield of matches?

It would be difficult to estimate it. Some idea may be gained by a glance at the figure paid for stamps. The Government exacts a revenue of one cent per 100 on matches manufactured. During the year ending May, 1881, the company paid for stamps, $4,500,000. This year the amount paid will be increased $50,000. You may figure it out yourself. There are 200 matches in a box. The tax is two cents; they are sold to the grocer for three cents, and retailed at five cents.

Figuring upon this basis, $4,500,000 represents that 455,000,000 one-cent stamps were used during the year, and as each stamp represented 100 matches, the grand total manufactured is 45,500,000,000 matches, or 277,500,000 5-cent boxes. This would give 910 matches per annum, for every man, woman and child in the country, and an expense of 22¾ cents for each.

A New Coloring Matter.—A Vienna chemist has succeeded in producing a new coloring matter on silk, which is a nice blue by day and a beautiful pink by artificial light. The alcoholic solution of this color is dark violet in a refracted, but red in a direct light.

Good Health.

Beef Tea not Wholesome Food.

Beef tea has long held a high reputation as an article of diet for the sick, but this reputation stands on a false basis, and is likely some day, if not soon, to fall. It has already received several blows, but none so hard as that given by G. F. Masterman, in a recent number of the London *Lancet*. This gentleman draws attention to the fact that in its chemical analysis it is very analogous to urine, except that it contains less uric acid and ures. No matter how carefully made, it contains only from one and a half to two and a quarter per cent. of solid matter, which is made up mainly of urea, kreatine, kreatinine, isaline and decomposed hæmistin—all of which are to be found in urine.

This is not the only author who has tried to impress the public with the fact that beef tea is a stimulant and not nutritious, and composed mainly of excrementitious matter. All this, however, has been of little avail, for we constantly find medical men and non-medical ones who still believe in its virtues, and if told that milk, or wheat meal and barley gruel, rightly prepared, are many times as nourishing, they look at you with a very skeptical stare. How often do we find the sick one starving with an endless supply of wines, jellies, essences of meat and beef tea in abundance, and orders to administer some of them every half hour. In a majority of such cases all this beautiful but worthless trash should be cleaned out at once and milk and gruels substituted.

There is one disease in which beef tea will prove specially injurious, and that is Bright's disease, for a person suffering from it should take no food which is likely to so greatly increase the very elements in the blood which the kidneys cannot eliminate. Dr. Neale states that in diarrhœa, dysentery and typhoid fever he has become convinced that this fluid is a poison. Dr. Brunton, of England, mentions the fact that mental depression and nervous diseases are made worse by it, and says: "We find only too frequently that both doctor and patient thinks the strength is sure to be kept up if a sufficient quantity of beef tea can only be got down, but this observation raises the question whether it may not frequently be injurious, and whether the products of muscular waste, which constitute the chief portion of beef tea and beef essence, may not be actually poisonous?"

It may be asked: "If beef tea is so similar in composition to an important excretion of the body, why should not the latter produce a similar effect?" To which it may be replied, that the effect produced by the two substances is very similar. In South America, urine is a common vehicle for medicine. The same substance has been highly extolled for small-pox. Among the Chinese and Malays it is freely used for the sick, and often apparently surpasses European remedies in its value. A traveler there says he has often seen it taken as freely and with the same gusto as beef tea is by the Europeans. We might illustrate this point by further facts, but it is not necessary.

It may again be asked, what do you give us that is better? The answer is, milk, oatmeal, wheatmeal, barley and cornmeal gruels. These latter, well made, are really valuable and not poisonous. Let beef tea, then, be dropped. No matter if it be elegantly made from Liebig's, or other extracts, it is, all the same, a worthless food and a poison, which may injure the one who takes it.—*Herald of Health.*

How Our Busy Young Men Destroy Their Health.

There was an inquest held the other day on the body of a city clerk which is instructive, in that it shows the madness of the railway speed at which too many live, and points to a new disease that completely baffles modern medical science. The disease, with its innumerable affiliated branches, is commonly and inaccurately known as "overwork." It should, with more direct truth, be called the nineteenth century malady of fuss and flutter, and the almost inourable fault of forgetting to live. Overwork does not, as a rule, kill any man; in fact, more men die from sheer idleness than from steady application; but what does kill men is the anxiety to get a good start and keep the lead, the nervous strain of pressing forward in the race of life, the extreme tension of the vital power caused by worry and increased by noise, locomotion, restlessness, harshness and the occasional cruelty of the world. This city clerk was simply an exhausted machine. Not yet in the prime of life, he paid the penalty of high-pressure at the early age of 36. He worked his brains and he worked his hands, he neglected sleep and nourishment as well, he was forever exhausting the system and never supplying the deficit, and at last, without any apparent warning, nature closed the account, and the career of the city clerk was over.—*Herald of Health.*

Warm Bed Clothing for Children.—It is fully as important that children should be warmly clad at night as during the day. Nor is it sufficient that the bed-clothing should be warm. Indeed, we are apt to err in using too many blankets rather than too few. Then the restless child kicks off the cover, and from a warm perspiration becomes chilled through, and a severe cold is the consequence. Delicate children should sleep in flannel, while for more robust constitutions Canton flannel in the lighter grades is heavy enough. Night-drawers are to be preferred to night-gowns, and the legs of the drawers should be long enough to reach the feet. Indeed, the style which covers the foot also, like a stocking, is an excellent one for children who are restless sleepers. Night-gowns for babies should be long enough to come down well over the feet, and flannels should be worn in cold weather, the pinning blankets which are furnished with all layettes. In every household where there is a baby, there should be at least one open fire where its feet may be occasionally toasted. No one can sleep healthily when cold, and the baby will rest much better if laid to sleep upon a warm blanket than between cold sheets.

Prescribing by Telephone.—A few evenings ago a physician of North Adams, Massachusetts, was called by telephone about one o'clock at night. The call came from Briggsville, about two miles away. A child was there suffering with the croup and in a critical condition. The night was dark and stormy, and the doctor found nothing pleasant in the contemplation of the trip which he was asked to make. When preparing to go out into the darkness and rain, his mind conceived a bright thought, which was immediately followed by acts. He called the Briggsville house in which the little sufferer lay, and requested the parents to bring it to the telephone transmitter. This was done. The child coughed its croupy cough, and the doctor listened intently to every sound which came from his patient. He prescribed a remedy, and one of the members of the family prepared and administered it. The relief was immediate and the recovery rapid. The doctor waited at the telephone until he heard of the favorable results of his prescription, and then sought again the repose of his couch, pronouncing blessings on the inventor of telephones.—*Hartford Post.*

A Hard Struggle.—There are many men who kill themselves in their attempts to keep themselves alive. They work because they must eat. With their tasks come worry, overwork, death. In these days it is difficult to live—that is, for some men. They are handicapped in their struggle. A portion of society has become possessed of the wealth that should be in the hands of their fellows. A glance around forces home to one's mind with power the fact that the man who has knowledge of himself—who knows how to maintain health of body, mind and morals, possesses a great advantage over other men in the struggle for life.

The Oregon Railroad and Navigation Co. have commenced with 600 men grading between East Portland and the Cascades. On account of the frequent rains progress will necessarily be slow.

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THE PUBLIC LANDS.—How to Make Known Our Vacant Lands, 38.

THE ENGINEER.—Engineering Progress for 1881; The Fast Steamer Line, 39.

USEFUL INFORMATION.—To Design a Monogram; Cleaning Brass; The Match Business, 39.

GOOD HEALTH.—Beef Tea not Wholesome Food; How Our Busy Young Men Destroy Their Health; Warm Bed Clothing for Children; Prescribing by Telephone; A Hard Struggle, 39.

NEWS IN BRIEF on page 44 and other pages.

Passing Events.

Notwithstanding the depression in the mining interests of California in 1881, due to the partial stoppage of hydraulic mining, California still holds the second place in bullion production, as will be seen by the tables prepared by Wells, Fargo & Co.'s Express, which we print in another column. Colorado leads by nearly five millions, but California is ahead of all the rest.

This week the weather has been milder than last. The cold wave which spread over the State last week was not alone an infliction to farmers and stock men, but was equally as damaging to the mining interests, as in freezing up the ditches and checking the flow of water, mining operations were quite generally suspended, and cannot be resumed to any extent until warm and copious rains come. Miners say that they never saw water disappear faster than it did last week, the north winds seeming to lap it up, and, in addition to this, the intense cold put a check upon the sources of supply. There is but little snow in the mountains with which to make water to fill the ditches, and without warm or rainy weather the miners see no prospect of washing to any extent during the winter. To all present appearances, they will have to wait until spring before doing any important work toward reaping the annual gold harvest.

We shall next week issue a 24-page edition of the MINING AND SCIENTIFIC PRESS, containing our annual mining review, and giving very full statistics of the mining industry on this coast.

THE MINING AND SCIENTIFIC PRESS is the oldest mining journal on this coast, and has been devoted to the interests of the miners since its inception. It should receive the hearty support of the mining community, as none who want to keep posted on all new processes and appliances, can afford to be without it.

Our Annual Review.

In the next number of the MINING AND SCIENTIFIC PRESS we will give a very full review of the mining industry for the year 1881. This will contain statistics of great value for reference and facts of importance for all interested in mining matters. The number will be an unusually interesting one, and will consist of 24 instead of the usual 16 pages.

Engineering Improvements Wanted.

The river and harbor appropriation bill each year is one over which the committees have a grand fight on reducing estimates. All the seaboard States want more or less done to their harbors and river mouths. The Atlantic coast, with its numerous harbors and large population, has had an advantage over us in securing aid of this sort, yet our representatives persevere in bringing our wants to public notice. California got a little money to fix up San Diego harbor; and more for the improvement of Wilmington and Oakland. Outside of a little snag pulling up the river, this is about all we ever got.

Oregon has got a good many rivers emptying into the sea, but she is sadly deficient in harbors, and her rivers all want more or less doctoring at the mouth. Each year appropriations are asked for to this end, but with comparatively little effect so far. This year, Congressman George has introduced a bill proposing the following appropriations for the improvement of Oregon and Washington Territory rivers and harbors: For the permanent improvement of the mouth of the Columbia, as recommended by Col. Gillespie, U.S. Engineer, $430,000; for constructing a Pacific Coast Harbor of Refuge at Port Orford, $250,000; for the Cascade Locks, $750,000; for the lower Willamette and Columbia, $133,000; for Coos bay, $60,000; for Yaquina bay, $60,000; for Coquille har, $25,000, and for the river above, $25,000; for the upper Columbia and Snake rivers, $20,000; for the upper Willamette and Yamhill rivers, $10,000; for the Umpqua river, $12,000; for the Lewis river, $5,000; for the Alsea river, $2,500; for the Cowlitz river. $2,000; for the Sinslaw river, $1,500, and for Young's river, $1,000.

Bullion Product of 1881.

We are indebted to Mr. John J. Valentine, General Superintendent of Wells, Fargo & Co.'s Express Co., for a copy of their annual statement of precious metals produced in the States and Territories west of the Missouri river, including British Columbia (and receipts in San Francisco by express from the west coast of Mexico), during 1881, which shows aggregate products as follows: Gold, $31,869,686; silver, $45,077,829; lead, $6,361,902; copper, $1,195,000. Total gross result, $84,504,417.

California shows a decrease in gold of $579,069, and an increase in silver of $323 582. Nevada shows a total falling off of $3,184,057; the yield from the Comstock being only $1,726,162, as against $5 312,592 in 1880—a decrease of $3,586,430. The product of Eureka district is $4,127,265, as against $4,639,025 in 1880—a decrease of $511,760. Utah shows an increase of $860,335. Colorado shows an increase of $1,672,171; and Arizona, $3,726,295 over our report of last year.

Statement of the Amount of Precious Metals Produced in the States and Territories West of the Missouri River, including British Columbia (and Receipts in San Francisco by Express from the West Coast of Mexico), During the Year 1881.

States and Territories.	Gold Dust and Bullion by Express.	Gold Dust and Bullion by other conveyance.	Silver Bullion by Express.	Ores and Base Bullion by Freight.	Total.
California	$16,349,216	$817,460	$588,882	$305,421	$18,060,979
Nevada	650,902	33,254	7,585,274	3,826,438	11,847,764
Oregon	67,309	3,364	40,681	1,000,000	1,111,354
Washington				13,000	13,000
Alaska	1,046,618	52,330			1,098,948
Idaho	1,186,820	59,341		1,007,386	2,253,547
Montana	1,907,150	95,358	370,540	689,800	2,962,848
Colorado	32,944	1,647	2,305,728	3,567,863	5,907,182
New Mexico	3,225,960	161,298	2,820,000	18,705,000	24,912,258
Dakota	396,697	19,834	77,000		493,531
Arizona (west coast)	132,232	6,611	6,278,895	1,390,942	7,808,680
Oregon (west coast)			1,699,216	301,000	2,000,216
British Columbia					872,500
	$30,019,223	$1,188,503	$35,567,824	$30,253,490	$84,504,417

The bullion from the Comstock contained 47.54% gold and 52.46% silver. Of the so-called base bullion from Nevada 44.70% was gold; and of the whole product of the State, 26.53% was gold.

The gross yield for 1881, shown above, segregated, is approximately as follows:

Gold	37.71%	$31,869,686
Silver	53.35%	45,077,829
Lead	7.53%	6,361,902
Copper	1.41%	1,195,000
Total		$84,504,417

Annual Products of Lead, Copper, Silver and Gold in the States and Territories West of the Missouri River, 1870-81.

Year.	Products as per W. F. & Co.'s Statements, including Amounts from British Columbia and West Coast of Mexico.	Product after deducting Amounts from British Columbia and West Coast of Mexico.	The Net Product of the States and Territories west of the Missouri River, exclusive of British Columbia and West Coast of Mexico, divided, is as follows:			
			Lead.	Copper.	Silver.	Gold.
1870	$54,000,000	$32,150,000	$1,680,000		$17,230,000	$13,240,000
1871	58,284,000	35,798,000	2,100,000		19,386,000	14,312,000
1872	62,236,359	40,351,824	2,236,000		19,924,429	18,191,395
1873	74,208,683	50,139,860	3,450,000		27,183,302	19,206,558
1874	72,703,133	49,000,000	3,500,000		24,939,122	20,560,878
1875	80,889,057	47,705,433	5,000,000		28,406,483	14,298,950
1876	90,875,373	57,219,859	6,194,000		33,937,934	17,087,925
1877	79,431,754	49,811,682	5,086,250		29,382,324	15,343,108
1878	81,154,622	49,276,167	3,452,000		41,846,119	33,978,503
1879	86,138,638	72,688,893	4,185,769		37,032,857	31,470,262
1880	84,504,417	81,158,474	6,361,902	1,195,000	37,248,137	37,576,000
1881					38,633,055	32,569,167
					42,387,613	30,655,359

The exports of silver during the present year to Japan, China, India, the Straits, etc., have been as follows: From Southampton, $21,000,000. From Marseilles, $1,000,000; San Francisco. $5 000,000. Total, $27,000,000 as against $34,700,000 from the same places in 1880.

Slides in the Rivers.

In the course of an examination as witness in the debris trial, Daniel C. Webster, of Volcanoville, El Dorado county, said: Above Volcanoville, there are some 50 or 60 natural slides, large and small. One above Pilot creek is some three-fourths of a mile long and 40 rods wide, and of an average depth of 20 ft. One is further up on the north side of the South Fork, of at least 40 acres, but I never measured it. It is about 1,500 ft. long and 100 ft. deep. Another is on the middle fork of the Middle Fork. It is at least 40 acres, but not so deep as some. Another, on the side of Mount Gregory, is three-fourths of a mile long and one-fourth of a mile wide, and from 10 to 20 ft. deep. Another is at where Volcanoville canyon empties into the river. It has gone out, in part, 200 ft. deep. It is a mile long. I've seen others still higher up on the Middle and South Fork. I've seen them at a distance. Around Volcanoville are a number of small ones. These slides in the South Fork expose soft granite; on the Middle Fork it is slate. This exposure washes continually, and forms common sand, and it goes into the South Fork, and from there to the Middle Fork, and I suppose must reach the Sacramento. That which will come in the future into the river will be very heavy material and hard to work out. That recently deposited, say within five or six years, is heavy. It is now in the bed of the Middle Fork. That bed has been filled for eight miles on an average to a depth of 30 ft. Where deep pools and riffles were, now is all filled up. Above Ford's Bar, near the mouth of Otter creek, the fill is 40 ft. I know of instances where this material has recemented in the bed of the river. In working this material the second time it has to be blasted with powder. This material is almost as compact as it was in its natural or original bed.

MR. J. F. OSBORNE, who has been successfully connected with the business of this office during the past two and a half years, will hereafter act as assistant business manager, and we bespeak for him the favorable attention of our many friends and patrons.

Drift Mining.

The Cost

Of running the main tunnel and all shaft work in the bedrock varies with the character and hardness of the latter. In soft slate, talcose rocks or serpentine it will cost as low as $6 or even less per foot, including the timbering and lagging. Harder rocks cost considerably more, $15 and $20 per running foot in some extremely hard slates. In blasting the harder varieties of rocks giant powder is used; black powder is found most effective in soft serpentines and similar rocks. The most economical way for the mine owner to run the tunnel, and in fact, to do all the underground permanent work of drifts, tunnels, shafts, winzes, etc., is by contract. Such is the practice in most of the large drift mines.

As soon as this main working tunnel is underneath the center of the channel, an upraise or incline, preferably the former, is made through the bedrock to the gravel. If it is not intended to continue the bedrock tunnel any further an incline is sometimes preferred, more particularly, if through it all the timbers and other material used in the mine are to be taken. Both are constructed in two compartments, one for gravel, and the other containing a pipe for the drainage and ladder for the men.

Considering that the tunnel is to be continued, and that a vertical shaft or upraise has been made from the point on the surface of the bedrock where the upraise enters the gravel, a main drift or tunnel is run, following the course of the channel. The course of the lower bedrock tunnel is made to correspond exactly with the course of this main drift in the gravel; and every 100, 125 or 150 ft., as the case may be, a connection is made between the two, by an upraise from the lower one. At each upraise, a cross drift is run in the channel at right angles to the course of the main drift or gangway, as far out on each side as pay gravel is found. Further connections between these cross drifts are made by working drifts parallel to the central one, at distances from it equal to the distances between the shafts. By this means, the ground to be worked is divided into square blocks of any desired convenient size.

It will, of course, be understood, that the method of opening up the gravel deposit described is not general, but rather the exception; in fact, is not always practicable. It is, however, typical of the method employed wherever possible, in the largest and best worked drift mines. Sometimes the bedrock tunnel is not run low enough, and instead of remaining in the bedrock, comes out of it into the gravel. In this case, if in the direction in which work is being prosecuted the bedrock pitches off, it may be necessary to run a new tunnel lower down. Whether necessary or not, will depend principally on the amount of water in the mine.

The Drainage

Of a drift mine is as far as possible by natural means through the lower tunnel. Usually there is a large amount of water in these old channels. In very few drift mines is the quantity to be handled nominal. The water which collects in the mine workings is conducted to the several upraises, that is, where it does not drain directly through the bedrock into the lower tunnel, and passing through them runs in a box or open channel either under the tramway or on one side of it to a large reservoir tank at the tunnel entrance, in which it is stored to be used as required in washing the gravel. In a drift mine worked through either a vertical or incline shaft, a pump of large capacity is almost invariably required. The flow usually increases as the mine becomes more opened, and is more often beyond than within the control of such pumping machinery as can be profitably employed. It sometimes happens that the tunnel running too high will not permit of natural slope drainage, being from 10 to 20 ft. higher than the bedrock of the channel. In this case, the running of a lower tunnel can be obviated by collecting the water in a sump close to the tunnel and drawing from it by means of a siphon regulated to the flow of water.

In the Mountain Goat mine at Damascus, in Placer county, a very ingenious utilization of a portion of the mine waters is made, by which power is obtained for pumping the remainder of the water, and for hoisting the gravel. A detailed description of this mine will be given in a succeeding paper in the series.

Ventilation

Requires considerable attention, but is rarely especially difficult. The workings in the drifting ground are generally connected with the surface by a tunnel or shaft, or both, independent of the bedrock tunnel. This, if a tunnel is termed the air gangway, and runs, connecting with all the cross drifts, preferably on one or the other side of the ground which is being drifted, and not through the middle of it. This gangway is well timbered, and care taken not to disturb the ground too much in its immediate vicinity. A cave closing it, might result in the loss of life among the men employed. Besides its use as an air passage, the miners use it going in and out of the mine, and all timbers, tools, cars, etc., are taken from the surface to where needed through it, thus leaving the lower tunnel exclusively for discharging the gravel. When there is not sufficient difference of elevation and temperature between the two tunnels

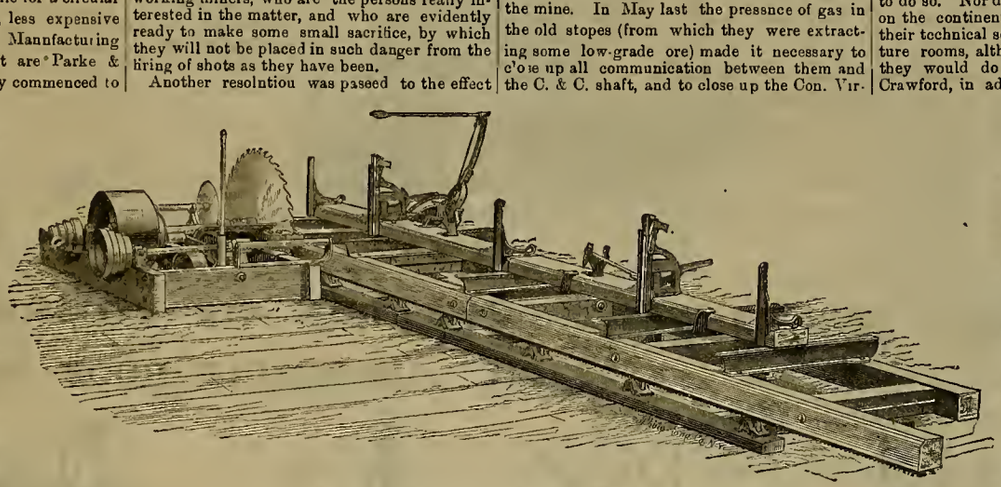
to cause the air to circulate, entering at the lower and leaving at the upper, a shaft is made connecting the air gangway with the surface, and an artificial draught created by the employment of fire. Where there is only one opening to the mine, ventilation is secured by the use of fans, the motive, where possible to utilize it, being the mine water.

Mining of the Gravel.

The main and cross drifts are run in the gravel on the surface of the bedrock, if the latter is hard and compact, containing no gold. Should the bedrock be soft it is liable to, and often does, contain considerable gold, in which case from eight or ten inches to two ft. of bedrock is removed. The gravel coming from the several drifts is washed separately, and from its yield the probable value of the adjacent ground is approximated. The squares into which the ground is divided for prospecting and working are of such size as to admit of the probable yield being estimated. In some channels in which there is little uniformity in the distribution of the gold in the gravel, this method is not practicable to any extent. All of the wider and more extensive channels admit of being estimated by this method. In estimating whether or not a certain block of ground will pay to take out, the gross yield or the yield per carload are not the only factors necessary; the amount of timber and lagging required and the hardness of the gravel must be taken into consideration. No general rule can be given as to what gravel will pay and what will not; the degree of richness which will render the mining profitable is determined by actual working test for each mine.

Improved Circular Saw Mill.

Desiring to meet occasional calls for a circular saw mill of the Lane pattern, less expensive than their No. 1, the Lane Manufacturing Co. (whose agents on this coast are Parke & Lacy, in this city,) have recently commenced to build mills which they call the No. 0, or "Plantation," as represented in the accompanying engraving. These mills are in some respects better and heavier than the earlier mills manufactured under the Dennis Lane patents, but they lack the foot-rig, the upright gauge roll, the double box for saw end of mandrel, the frost-dog and the "round-edge" uprights, included with the higher priced board machines manufactured by this company. The feed and gig back works are of the well-known "spring box friction" pattern—convenient, effective and serviceable. Although not specially recommended for saws larger than 48 inches, these Plantation mills will take on saws 54 inches in diameter.



THE PLANTATION CIRCULAR SAW MILL.

These mills cost with wood frame, 25 ft. carriage, no saw, $350, and other improvements made by the company are added as extra. Though, as this name indicates, this Plantation mill has been designed more particularly to meet the wants of small lumbermen in the South, it will be found adapted to many situations in every section, since it supplies a mill with a good Lane set-works at a price quite as reasonable as is asked for ordinary screw-block or quite defective lever-set mills.

THE PROPOSED PARK AND THE MINING INTERESTS.—We have before mentioned the project of Senator Miller to preserve as a park certain tracts of timber in Tulare, Fresno and Inyo counties. A part of the feeling against the bill in the localities mentioned arises from an objection to its including mining lands, and such timber belts on the extreme western and eastern slopes of the Sierras as can furnish the inhabited and inhabitable valleys with lumber, in the immediate and remote future. The limits stated for the park proposed in this bill would include a large part of such slopes, and would embrace hundreds of mining claims in and around the Mineral King mining district. The opposition to this led the Board of Supervisors of Tulare county to telegraph to Senator Miller, requesting a delay in the passage of his bill, that will lead, it is hoped, to such modification of its terms as will sufficiently protect the lumber and mining interests. A letter in reply has just been received from Senator Miller. He expresses entire willingness to so contract the limits of the proposed park as to leave mining and lumbering districts free. He not only disclaims the slightest intention to cripple these interests, but shows that a chief purpose of the bill is to so protect the mountain forests as to prove a general benefit to the people of Tulare and Owens valley. He desires information that will aid in fixing safe limits to such government reservation.

A MINER named Scoot has arrived in Tombstone, A. T., from the Sierra Madre mountains of Mexico, where he has been living for the past seven months. He states that the Apaches are on the warpath in that region, and that himself and two companions barely escaped with their lives. They had a running fight with 35 Apaches.

Prevention of Mine Accidents.

A miners' conference was held at Birmingham the other day, on which occasion a good many things of interest to miners were discussed. The President, in the course of his address, alluded to the legislation in reference to the use of powder in mines, which has certainly, so far, been most beneficial to the miner without injuring the interests of the employers, although the letter are strongly opposed to the interpretation put upon the clause in the act of 1872 by the law officers of the Crown. That interpretation in many districts is certainly opposed to the interests of the men, who, on the firing of a shot, have to leave the mine, or that part of the mine at least where the blasting is taking place. Notwithstanding the loss that must necessarily accrue to the workmen by leaving off work, the conference upheld the decision come to by the Home Secretary, for a delegate from Yorkshire moved a resolution declaring that the interpretation put upon the clauses of the Mines' Regulation act of 1872 by the law officers of the Crown, relative to the use of blasting powder in mines, was the only real meaning of the act, and that the Home Secretary should be recommended to enforce its general adoption, whenever the act was applicable. The enforcement of the clause as interpreted by the Attorney General and the Solicitor General, although it may have the effect of lessening the output of a mine at certain times, must certainly contribute to the safety of the miners. It may therefore be taken for granted that any attempt made to alter the clause on the part of mine owners will be successfully opposed on the part of the working miners, who are the persons really interested in the matter, and who are evidently ready to make some small sacrifice, by which they will not be placed in such danger from the firing of shots as they have been.

Another resolution was passed to the effect that it was necessary to insert a clause in the Mines' Act making it imperative upon owners to erect at every pit bank a house properly fitted with necessary appliances of every description to relieve the various kinds of accidents which are so frequent in mines, and that they should also provide some fitting conveyance to take home those who have been taken by accidents in the mines. At many mines there are now the most approved ambulances by which injured persons are taken to their homes in something like a Christian manner, without unnecessary pain, but there are still other places where these have not been adopted. An old, springless, jolting cart has been the ordinary mode of carrying a poor fellow in the agonies of death from where he has been working active and strong to the house from which he may never walk again.

Machinery Not "Locatable."

The quicksilver claims near Steamboat Springs, Washoe county, Nev., have been relocated as abandoned, no work having been done on them for two years. We notice that one of the Nevada papers, usually better posted, says that the works, said to have cost $30,000, are on the ground, and become the property of the relocators. This is wrong. The Government can not compel a man to work a furnace or a steam-engine, and spend so much a year on it. Such things never belonged to the Government, as the mineral land did, so that a failure to comply with conditions imposed by the Government on the locators of the lands can by no possibility be made to throw a man's steam-engine or furnace "open to relocation." Buildings, tools, machinery, etc., belong to the man who paid for them, and he can claim them any time. The relocator of a mine must account for anything of this kind he finds, provided the original owner appears. This is nothing which the Land Office or the Government has anything at all to do with.

In fact, it was not long since decided—and we published the opinion of the Commissioner at the time—that ore from the claim, not out on the surface at mouth of tunnel or shaft, belonged to the man or men who got it out, not to relocators of the mine. Therefore, if a miner relocates a mine, he has no right to the ore already taken out, and in case the original owner comes along, he can make him account (in the courts) for the ore he left there, provided an unreasonable time has elapsed.

A good many men seem to have this erroneous opinion, that machinery, etc., is relocatable because the claim is. A moment's thought will prove the fallacy of this belief. The Government gives the land, or mine, to any one who will work it, under certain conditions, failure to comply with which results in a forfeiture of the right, which then lapses again to the Government, which can then, and does, give it to the first man who finds it abandoned. The principle is a good one and has worked well since it was inaugurated, May 10, 1872.

But the Government cannot take away a man's machinery or tools because he has not used them on the mine. It never had any title to them, and so cannot say the first man who finds them can take them. This is an simple a proposition it seems scarcely debatable, yet that there is an erroneous impression prevalent is shown by the fact that a newspaper familiar with mining matters, should give publicity to such a statement as we have referred to.

The Consolidated Virginia Mine.

The famous Consolidated Virginia mine during the past year produced 6,435 tons of ore. There were reduced 6,816 tons, yielding bullion worth $144 064.10, or $21.13 per ton. This yield was over 81% of the assay value of the ore, no allowance being made for moisture. There were also 8,307 tons of waste rock taken out of the mine. In May last the pressnce of gas in the old stopes (from which they were extracting some low-grade ore) made it necessary to close up all communication between them and the C. & C. shaft, and to close up the Con. Virginia shaft (which was at that time a strong upcast) with the view of smothering any fire that might exist, and preventing the gas interfering with the progress of work in other portions of the mine. The closing of the Con. Virginia shaft made it necessary to change the Ophir shaft from a down-cast to an up-cast, which condition was maintained until September, when they were enabled to reopen the Con. Virginia shaft and turn the Ophir shaft a down-cast again, taking precautions to prevent any fire that might remain in the old stopes from spreading, and confining the gas arising therefrom to that part of the mine. The work of bulkheading the drift connecting the old stopes with the Gould & Curry on the south, Ophir on the north, and the C. & C. shaft on the east, and the changing of our air current and system of ventilation, seriously interfered with the progress of work in the mine during the four months it was in progress. In November last, the Con. Virginia Co., jointly with the Best & Belcher and Gould & Curry companies, erected a large suction or exhausting fan on the old Gould & Curry shaft, which, by at least doubling the upcast capacity of that shaft, materially assisted the ventilation of the lower levels through the systems of drifts and winzes connecting with it.

The 1650 and 1750 levels produced 6,435 tons of low-grade ore during the year, the extraction of which was interrupted by the necessity of closing up the stopes as described above. There yet remains some low-grade ore in places, which may be extracted at some future time.

The superintendent says in his report: A large amount of necessary dead work has been done, and we are now in a better condition to prosecute our explorations in depth that at any previous time.

A FAN has been placed in position in the east drift on the 2,275 level of Overman which is aiding ventilation. A crosscut has been started from the south drift, which is in 45 feet, and has struck several stringers of ore.

BRUSH ELECTRIC LIGHT.—The works and office of the California Electric Light Co. will be moved about Feb. 1, to Jessie St., between Third and Fourth—rear of Grand Opera House.

AT the Crown Point about 600 tons of low grade ore are extracted and reduced each week

Technical Education.

In recent numbers of the MINING AND SCIENTIFIC PRESS we have given attention to this important subject, and it is greatly to be hoped that the city of San Francisco will before very long take some steps in this direction, if it hopes to become more of a manufacturing center. Those who have studied the signs of the times cannot doubt that technical education is forcing itself more and more to the front. Towns which take the matter in hand will have a much better chance of maintaining their position than towns which do not. The rule of thumb and practice of our forefathers will not do now. We must ask the why and wherefore; we must separate the right from the wrong; we must know how to retain the one and what to substitute for the other. Technical education enables us to do all this, and before this century elapses, such instruction should be provided in every large town.

In addressing a public meeting in an English town the other day, a gentleman who had had considerable experience in this kind of instruction, told the audience about what had been done at Wigan, where several evenings in each week they passed through the class rooms a hundred students, and had upon their books last session 200 names of persons, of all ages from 12 up to half a century. Some of Mayor Taylor's remarks will answer some questions which may arise in the reader's mind.

"It might be asked, what did they teach them? Did they make them engineers and colliery managers and miners and ironworkers and builders? No, they did not, and did not profess to do so. Nor did they go as far as many towns on the continent, and have in connection with their technical school workshops as well as lecture rooms, although he hoped and believed they would do so some day. Indeed, Lord Crawford, in addressing their students a few weeks ago, advised this to be done. What they did was this: They explained the principles of mining, the methods of ventilation, the composition of gases met with in coal mines, the causes of accidents and how to prevent them. They explained the principles of iron and steel manufacture, the materials used and results obtained. They explained the action and cause of the action of the steam engine and other machines. In addition to this, they made visits to engineering establishments, mills, factories, printing works, and iron and steel works; and they descended mines and saw operations below ground. This was what in Wigan they called technical education, and it simply meant that they gave their students a knowledge of those scientific principles essential to the progress of their particular avocation. He claimed this for his own town of Wigan and its surroundings, that more progress had been made in extending and improving their staple industries during the last 25 years, than during any century previous. It was remarkable that the Wigan Mining and Mechanical school was established exactly a quarter of a century ago. He might be thought to assume too much, that the advancement of his town and neighborhood had any connection whatever with technical education. But he was, nevertheless, bold enough to hold the opinion that a technical school which, during its existence, had passed through its hooks several thousand students, some of whom were now mining engineers, mechanical engineers, iron-masters, coal proprietors, inspectors of mines, colliery managers, and which drew from all parts of the county each session aspirants for similar positions, must have done and be doing good."

CORRESPONDENCE.—Friends of the MINING AND SCIENTIFIC PRESS in the various towns and camps throughout the coast are respectfully asked to send us items or notes concerning the mining affairs of their localities. Courtesies of this kind will be gratefully appreciated and kindly reciprocated. It is not necessary to be skilled writers to do this. Send us the notes, and we will put them in shape for publication. Write plainly, on one side of the sheet; be careful about writing names, etc., and we will attend to the rest. There are many isolated places that our readers would be glad to hear from; and we do not want to have to notice always the prominent mines only, about which plenty is written. Tell us about the prospects and developing claims, the resources, needs and wants of the region. People who will tell us about such things we cannot hear from too often.

YESTERDAY Wells, Fargo & Co., received 32 car loads of Horn Silver bullion, valued at $80,000. This is the largest shipment ever made in one day by any mine in the United States since the famous days of the Comstock bonanzas. So says the Salt Lake *Tribune* of the 11th.

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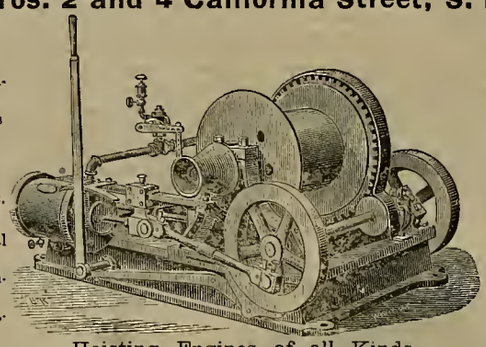
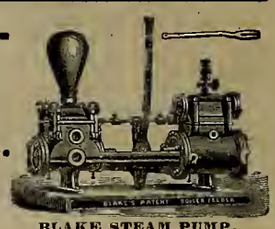


Hoisting Engines of all Kinds.



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It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

—o—

No. 1 XX is the Strongest Explosive Known.
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PATENTED IN THE UNITED STATES PATENT OFFICE.

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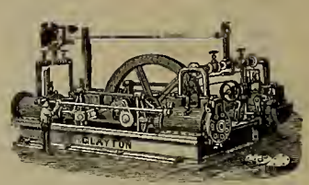

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Having been appointed Sole Agent for this Compressor, I will keep a full stock of the different sizes in store. Prices much less than any First-class Compressor in the market. SEND FOR CATALOGUE.

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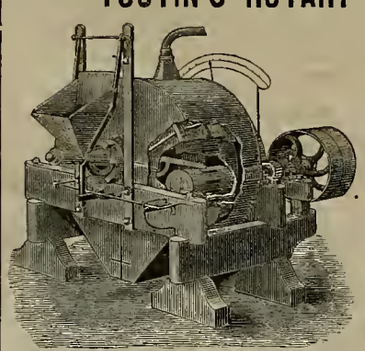

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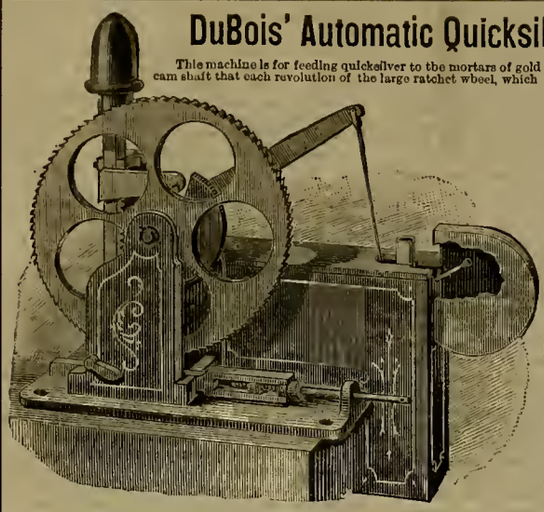
This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.
The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.
A chief point of excellence of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; *i. e.*, from every one to four minutes.
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IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds It costs $1,500 ready for the belt Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.

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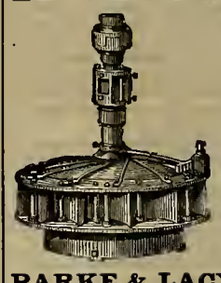
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HIGHEST PRICES PAID FOR
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This power is light and strong, so that two or more horses can be used for crushing ore or other work.
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Civil and Mining Engineer.
Formerly of Columbia College School of Mines, now of Colo State School of Mines, will examine, survey and report on property or methods. Box 409 Golden, Col.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING JANUARY 3, 1882.

251,819.—SELF-CLOSING STOPPER FOR BOTTLES—David Berry, Bolinas, Cal.

251,849.—HYDRO-CARBON BURNER—E. A. Edwards, San Buenaventura, Cal.

251,857.—STOVE PIPE—A. Flohr, Sacramento, Cal.

251,715.—HAND LEVER ATTACHMENT FOR STEAM PUMPS—Wm. D. Hooker, Oakland, Cal.

251,902.—BOTTLE COOLER—C. H. Lanfketter, Sac'mento.

251,909.—SOLDERING APPARATUS—Albert Lusk, S. F.

251,786.—BASIN PLUG—J. C. Luding, S. F.

251,799.—SELF-FEEDER FOR THRESHERS—John Scholl, Elk Grove, Cal.

251,966.—TICKET HOLDER—Jas. G. Tait, Stockton, Cal.

251,984.—GRAIN CLEANER—Wm. Williamson, Rio Vista.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

DIRECT-ACTING ENGINE.—George E. Dow, S. F. No. 252,084. Dated Jan. 10, 1882. This invention covers certain improvements in direct-acting steam engines, and it consists in a novel combination of main and auxiliary valves and ports and the supplemental pistons, so that both valves are driven by the direct motion of the auxiliary piston. The necessary amount of lead is given to the auxiliary valve by making the main valve somewhat shorter than the recess in the piston, in which the valves lie and by which they are driven. By this arrangement, Mr. Dow is better able to control the movements of the engine, particularly at the point of reversing, as the main valve has at that time moved gradually to the center of its travels, or lapped positions, thus automatically closing its ports, both induction and eduction. This admits of working the main steam piston very closely to the cylinder heads with safety, as the slightest acquired momentum of the piston and its connected reciprocating parts reverses the main and auxiliary valves immediately after reaching the normal point for the change of stroke. The effect of this is to give a live steam cushion and release from the acting side of the piston, without the great clearance space employed in other engines operated by steam-moved valves. Mr. Dow applies his invention to his direct-acting steam pump, two very large ones of which type have lately been put in the new sugar refinery of Mr. Spreckles.

HARNESS AND TRACE COUPLING.—Geo. W. Hunter, Merced, No. 252,108. Dated Jan. 10, 1882. This invention relates to certain improvements in devices for readily connecting parts of harness together, or for attaching the same to vehicles; and it consists in the employment of a peculiar link attached to the strap or trace and having a cylindrical bolt with a flattened head. This bolt is fitted to enter a hole formed in the head of a shank or pin which is driven or screwed into or otherwise secured to the singletree, pole, neck-yoke, etc., and one side is slotted, so that the side bar of the link may pass through as the belt is inserted. The link is then turned around until the side bar is at the opposite side from the slot, and is thus locked in place. The hole in the fixed head is made eccentric with its periphery, so that when the link has been turned around it will bind and prevent noise or rattling.

SPRAY NOZZLE.—Peter Loog, D. C. Vestal and A. F. Meregot, of San Jose. Dated Dec. 27, 1881. No. 251,448. The invention is a spray nozzle for a hose or pipe, the object of which is to eject water or other liquid in a fine spray, so that it may lightly and gently cover the object against which it is directed. The invention consists in providing a hose nozzle with an elongated oval slit or aperture, contracted at its ends and widening at its midleugth, for the passage of the water, whereby it is sprayed. It also consists of sundry details of construction.

PAPER BAG MACHINE.—A. Beyer, Oakland. Dated Dec. 27th. No. 251,402. This invention relates to certain improvements in that class of machines used for making paper bags; and it consists in an improved construction of the forming and folding blades, and in the addition and application to the ordinary general operation of folding the paper into bags of a novel means of pasting the bags, and also for printing any desired design or label thereon.

WINDMILL.—Thos. Martin, San Jose. Dated, Jan. 10, 1882. No. 252,116. This invention relates to windmills and to improvements in the construction of certain parts thereof, whereby the inventor is enabled to provide a strong and useful mill. These improvements consist in the construction of the wheel and the blades.

Early Locators.

It is a singular circumstance, and quite assed as singular, that the reputed discoverers of the most prominent ore deposits in Nevada and California early met with a terrible fate. It is recorded that Allen and Hosea Groesoh, as early as 1853, reported the discovery of a silver ledge lying east of and along the side of Sunrise peak, since called Mount Davidson. These brothers had some knowledge of geology. The discovery they made was subsequently named the Comstock lode, in compliment to a Carson merchant. The Groesch brothers were unable to work their discoveries for want of water, chemicals and machinery. In 1857 they determined to prosecute their find by procuring the necessary facilities; but before they could consummate their plans, Hosea died from the effects of a pick wound in the foot. Allen then started for San Francisco to procure machinery. He was caught in a storm, and reduced to the extremity of subsisting on his own mule. He was rescued, but subsequently died from the effects of that exposure. But for these circumstances, the great silver deposit of Nevada might have borne another name.

Hardly less melancholy was the fate of the discoverer of what has since become a prominent mining camp in California. It is recorded that the ore discoveries at Bodie, Mono county, California, were made in 1859 by W. S. Body, of Poughkeepsie, N. Y. The district was named the Bodie district, after the discoverer, but it was subsequently ascertained that the name should have been Bodie, instead of Body. The first quartz claim was taken up in August, 1859, and was known as the Montauk, now known as the Goodshaw. In March, 1860, while returning from Monoville with E. S. Taylor, they were overtaken by a storm and lost their way. Mr. Bodie became exhausted, and Mr. Taylor attempted to carry him, but was compelled to wrap him up in a blanket and leave him, while he proceeded for help. Before he returned, Mr. Bodie was dead. During the same year Mr. Taylor was killed by the Indians near Benton, in the same county. Thus perished four persons intimately connected with two prominent mining districts.—*Pioche Record.*

Willis Mining District.

From a private letter from Willis mining district, Kern county, California, we gather the following facts: We think we have the starter here for a pretty good mining camp. We are two miles about south of the North Fork of Kern river, and between Erskine creek and the South Fork. The ledges are all of them of a good size, and those that have been sunk on have developed pretty good ore—chloride and horn silver; one mine at 25 ft. Some ore has assayed $1,980 per ton, some $1,600, and some $1,000. The last two are on the same lead. The mine from which the first-mentioned ore came is about one mile south of the latter, the ledges running parallel. From late information at the district recorder's office there were about 26 locations and six different prospecting camps.

Some galena ore has been found in the same neighborhood. The owners of the Last Chance, whose ore assayed $1,900 per ton, are going to sink 100 ft. on their mine. They have an offer for it if it holds out at 100 ft. as it is now.

Pacific Coast Weather for the Week.

[Furnished for publication in the PRESS by NELSON GEROM, Sergt. Signal Service Corps, U. S. A.]

The following is a summary of the rainfall for each day of the week ending Wednesday, Jan. 18th, at noon, for the stations named:

Date.	Olympia.	Portland.	Roseburg	Red Bluff	Sherman'to	San Francisco	Vinalia.	Los Angeles.	San Diego.	
Thursday.	.00	.00	.00	.00	.00	.00	.00	.02	1.53	
Friday....	.00	.00	.00	.00	.00	.00	.00	.04	*	
Saturday.	--	--	.00	.00	.00	.00	.00	.00	*	
Sunday ..	.02	.--	.00	.00	.00	.00	.00	.02	*	
Monday ..	.00	.00	.00	.00	.00	.00	.00	.00	.01	
Tuesday..	.00	.00	.00	.00	.00	.00	.00	.00	.00	
Wed'sday.	.05	.03	.03	.00	.00	.00	.00	.00	.00	
Totals....	.07	0 03	0.03	0.00	0.00	0.00	.00	.08		

*Reports missing.
Dash (—) signifies too small to measure.

DEPREDATIONS upon the Government timber lands in the West have increased to such an extent that the Secretary of the Interior urges the Attorney-General to use all the means in his power to arrest and punish offenders. While they are about it, the idea would be a good one to arrest and punish offenders who commit depredations on Government funds in the East. That would make work at both ends of the line.

THE Supt. of the Senate folding room says he now has on hand, belonging to Senators, at least 500,000 volumes that have been printed by order of Congress for distribution. Some Senators and Representatives are very indifferent about sending out documents, while others not only send all they are entitled to, but get from other members all they can and send them to their constituents.

News in Brief.

SILVER ore has been found near San Luis Rey, San Diego county.

EMPEROR WILLIAM is anxious for Germany to participate in Arctic exploration.

MR. LORING, Commissioner of Agriculture intends visiting California in the early spring.

SMALLPOX is very prevalent among the colored population of Virginia and the Carolinas.

A BILL has been introduced in the House for the admission of Washington Territory as a State.

THE Cremation Society of New York has secured half of the $25,000 required to erect a furnace.

IN the first of the three matches between Dr. Carver and Bingham, the former killed 126 and the latter 123.

ONE hundred and fifty years ago London was famous for her roses, but to-day no rose will grow there. Cause, smoke.

IT is safe to say that the outward and inward tonnage of Puget sound for the year 1881 aggregated about 1,000,000 tons.

IT is stated that the De Lesseps Canal Co.'s second call of 25%, amounting to $15,000,000, has been paid in full at Paris.

A CHICO fruit-raiser has just leased 12 acres of orchard to Chinese for five years at a yearly rental of $800, or $66⅔ per acre.

ON Puget sound there are 42 steamers with an aggregate tonnage of 4,850 tons. These are all engaged in the Puget sound trade.

THE Mexican National railway has been completed across Tamaulipas, and is being laid at the rate of a mile a day in Nuevo Leon.

THE taxable property of Oregon, as per assessment just completed, is $59,256,175; total tax, $325,908. Multnomah county bears one-fourth of the tax.

MAJOR CATHCART, one of the principal members of Gen. Fremont's expedition, which, in 1848, made a winter journey across the plains to California, is dead.

DR. DRAPER'S death elicits fresh recognition in England of his works, which are among the most enduring and admired American contributions to the literature of science.

A MARSEILLES correspondent mentions that intense cold weather prevails on the Sahara frontier, and hundreds of camels and many soldiers have died from the cold.

A SURVEYING party, with a complete outfit, under the charge of the Atlantic and Pacific railroad, left Los Angeles last Sunday to run a new experimental line on the Mohave desert.

THE contempt proceedings in the Marysville courts against the Bloomfield and other mining companies, have been continued until February 6th. This is the fourth continuance of the proceedings.

THE next sailings of the Pacific Mail Steamship Co.'s steamers will be: *City of Peking*, for Yokohama and Hongkong, Feb. 11; *Australia*, Feb. 11, for Sydney and Auckland; for New York, via Panama, Feb. 4.

GOVERNOR SAFFORD is withdrawing his interests in Arizona Territory for the purpose of devoting himself entirely to the great Florida land reclamation scheme, in which he is largely interested.

THE exceedingly cold weather for the last few days has frozen ditches and flumes in Nevada county until mining has been somewhat suspended, owing to the water supply being choked off.

LAST Thursday of last week snow fell so deep in the San Gorgonio pass, on the border of the Colorado dessert, as to seriously hinder the trains of the Southern Pacific railroad, a circumstance never known before.

THE California Iron Company has recently purchased 4,600 acres of timber and mineral lands. The company now owns 7,620 acres near Hotaling. Clipper Gap made a successful run last year, producing 4,414 tons, and now takes its place as one of the permanent industries of the State, and is in strong hands.

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THE MINING AND SCIENTIFIC PRESS is the leading mining journal in America, and enjoys a larger circulation among the more intelligent operators and workers in the gold fields of the world.

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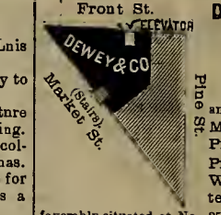

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THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

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[WHOLESALE.
THURSDAY, January 19, 1881.

IRON.—		
American, Pig, soft, ton	— —	@30 00
Scotch, Pig, ton	25 50	@27 50
American White Pig, ton	— —	@— —
Oregon Pig, ton	— —	@23 00
Clipper Gap, No. 1	— —	@28 00
Clipper Gap, White	— —	@32 00
Clipper Gap Car Wheel	— —	@35 00
Refined Bar	4	@
Horse Shoes, keg	— @	5 50
Nail Rod	— @	7¼
Norway, according to thickness	6¼ @	70
STEEL.—		
English Cast, lb	13 @	15
Black Diamond, ordinary sizes	— @	15
Drill	15 @	16
Flat Bar	16 @	18
COPPER.—		
Ingot	— @	22
Sheet	— @	20
Sheating, Tinned 14x18	— @	31
Nails	— @	—
Bolts	— @	33
Old	— @	—
Bar	— @	22
Cement, 100 fine	— @	15¼
LEAD.—		
Pig	— @	5
Bar	— @	6
Pipe	— @	8
Sheet	— @	8
Shot, discount 10% on 500 Bags		
Drop, per bag	— @	2 10
Buck, "	— @	2 30
Chilled "	— @	2 50
TIN PLATES.—		
10x14 I C Charcoal	— @	7 50
10x14 I C Coke	6 15 @	6 40
Banca Tin	— @	22 50
Australian	— @	23 50
I. C. Charcoal Roofing 14x20	— @	6 90
ZINC.—		
By the Cask	— @	9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @	10
NAILS.—		
Assorted Sizes	4 00 @	4 15
QUICKSILVER.—		
By the flask	@37½	41
Flasks, new	— — @	1 25
Flasks, old	— — @	1 05

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DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

San Francisco, Cal., January 10, 1882.

At a meeting of the Board of Directors of the above named company, held this day, dividend No. 50, of fifty cents (50c) per share, was declared, payable on Monday, January 10, 1882. Transfer books closed on Wednesday, January 11, 1882, at 3 o'clock P. M.

WM. WILLIS, Secretary.

Office—Room No. 20, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company,

San Francisco, January 10, 1882.

At a meeting of the Board of Directors of the above named Company, held this day, a Dividend (No. 25), of Twenty five Cents (25c) per share was declared, payable Monday, January 16th, 1882, at the office of the Company, room 10, No. 328 Montgomery Street, San Francisco, Cal. Transfer books will be closed on January 11th, 1882, at 3 P. M. JOSEPH NASH, Sec'y.

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The German Savings and Loan Society.

For the half-year ending December 31st, 1881, the Board of Directors of THE GERMAN SAVINGS AND LOAN SOCIETY has declared a dividend on Term Deposits at the rate of Five (5) per cent. per annum, and on Ordinary Deposits at the rate of four and one-sixth (4 1 6) per cent. per annum, free from Federal Taxes, and payable on and after the 9th day of January, 1882 By order, OEO. LETTE, Secretary.

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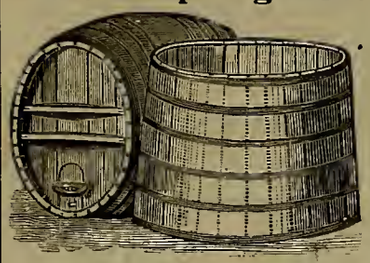

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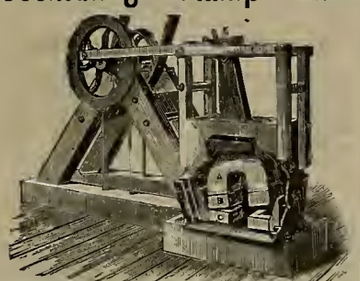
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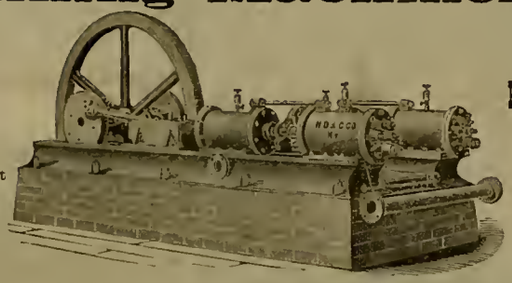

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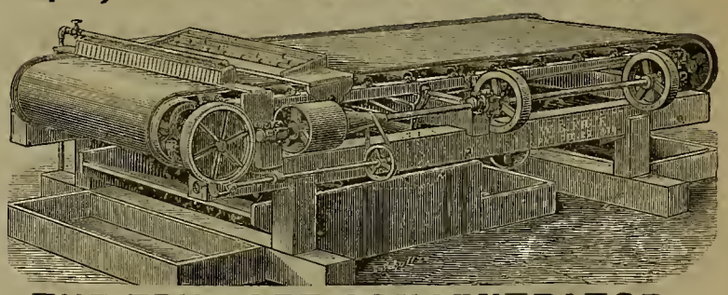

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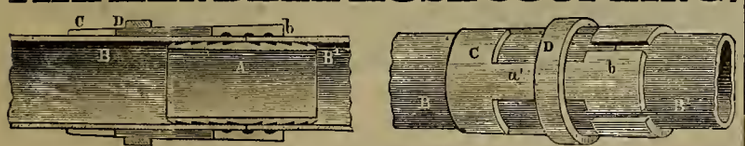

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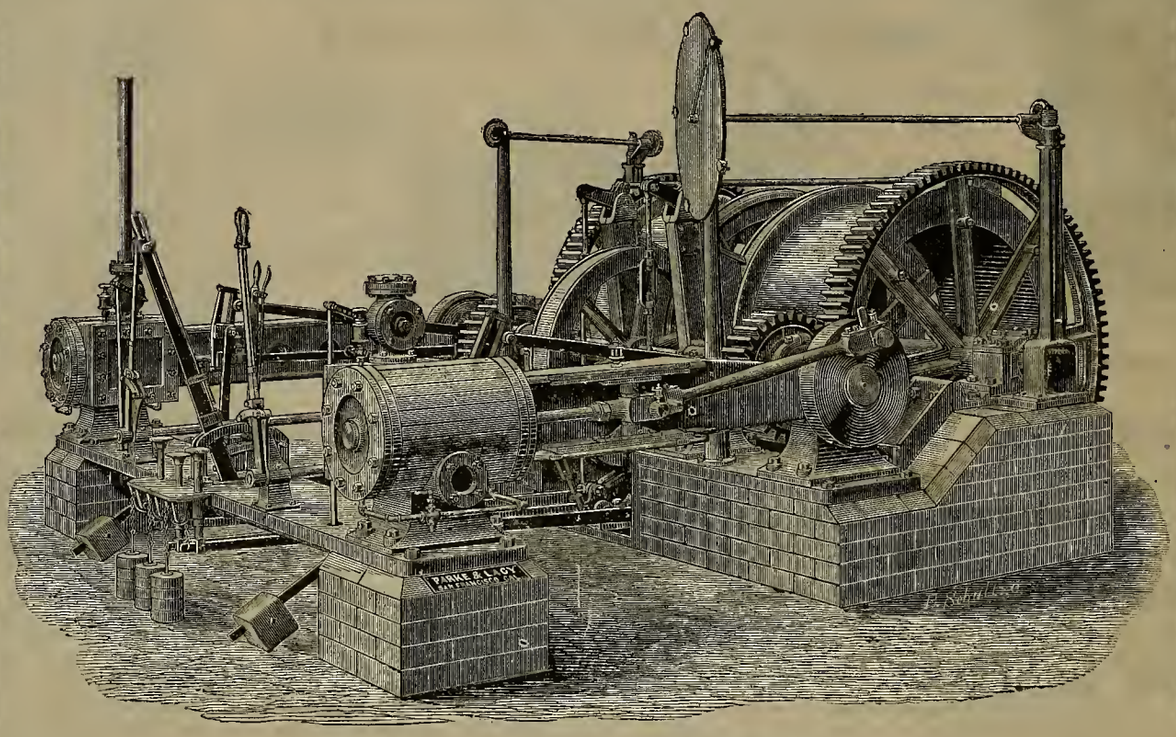

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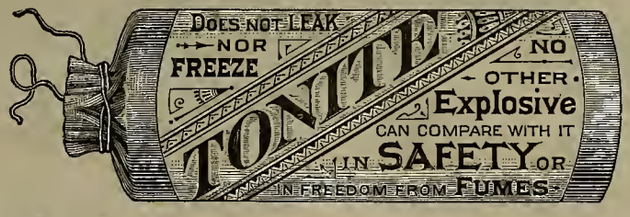

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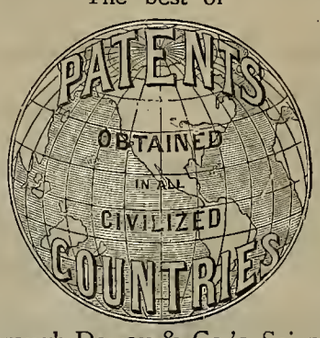

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An Illustrated Journal of Mining, Popular Science and General News.

TWENTY-FOUR PAGE ISSUE, CONTAINING ANNUAL MINING REVIEW.

BY DEWEY & CO., Publishers. | SAN FRANCISCO, SATURDAY, JANUARY 28, 1882. | VOLUME XLIV. Number 4.

Construction of Mining Flumes.

In the mountaine of California where water ie stored in very large quantities, for nee during the year in hydranlic mining, very many engineering difficultiee are met with in conveying it to the point of nee. Thie ie due to the rngged character of the conntry, formed as it ie of steep monntains, high ridgee, deep canyone, gulchee dry for months and then filled enddenly with foaming torrente of water. Some of the fineet engineering work in the world hae been done in theee monntain regione. We pnblish in this isene engravinge, ehowing some "flume engineering," the novelty of which, we feel satisfied, will be ae eeneihly appreciated hy onr readers ae hy onrselvee.

Althongh we had frequently heard of this particnlarpiece of work, we had not seen anything that wonld enah'e ne to form an opinion ae to ite merits nntil qnite recently, when we were ehown photographe of it, which showed plainly many of the difficnlties met with, and overcome in its conetrnction.

The engravinge we have had made are excellent reprodnctione of the photographe referred to, and give a very distinct idea of the manner in which the work was done, and a general view of it after completion.

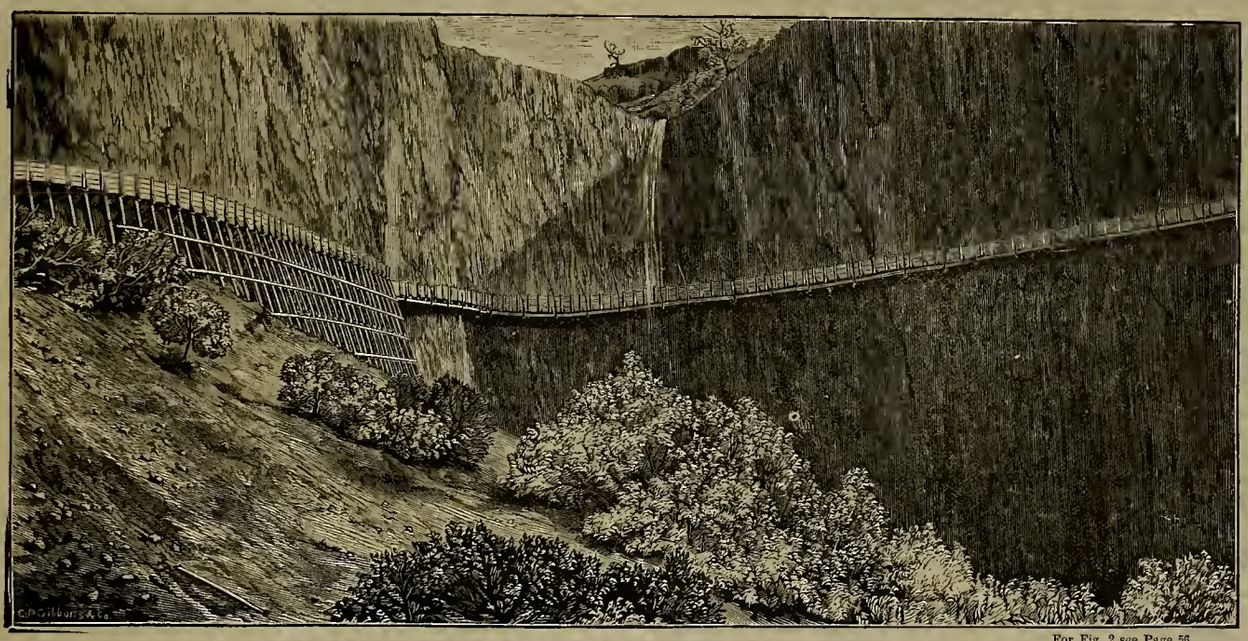

FIG. 1.—BRACKET FLUME OF MIOCENE MINING COMPANY'S DITCH, BUTTE CO., CAL.

For Fig. 2 see Page 56.

It is located at the head of what ie now called "Bracket canyon," in Butte county, in thie State (ahont 10 milee from Oroville), and is a part of the flnming on the Miocene mining company's ditch. It was deeigned hy and constrncted nnder the immediate enpervieion of Mr. Wm. H. Bellows, Supt. of Conetrnction of that compeny's ditch and flumee. In order to eecape the necessity of a treetle-work 186 ft. high, as deeigned hy the engineer who located the line, Mr. Bellowe determined to rnn the line of ditch up the canyon eome 200 yards, where it ends againet a perpendicnlar wall of rock 350 ft. high. Aronnd thie wall the flume was carried on iron hrackete eet eight ft. apart, each hracket capahle of enetaining a weight of 14½ tons. The length of thie bracketed portion is 486 ft. The flume rune around 118 ft. above the hed of the ravine and from the flnme to the top of the cliff ahove ie over 200 ft.

The Oroville *Mercury*, in an article deecriptive of the Miocene ditch, speaking of this particnlar piece of work, eaye: The man that carried the idea into practical form from ite inception to final completion is Wm. H. Bellowe, the engineer in charge of the work. To him was delegated the taek of carrying many hundred feet of flume acroee an inacceseihle gorge, without treetle-work, or other eupport than that which conld he given hy the perpendicular walls of haealt that etand in fluted columns at the head of the ravine. "What man has done man can do," has often heen eaid; hut thie particular kind of work had never heen done anywhere, and as it was wholly without precedent, the hnilt. From the uprights at the eide of the flume rnn euependere, ¾ inch round iron being used; they also having had holes drilled in the rock for their insertion and are clamped and eoldered secnrely. The flume, which is 4 ft. wide, ineide measurement, and 3 ft. deep, having a capacity of 3,000 inchee of water, is a epeciee of work with which everyone hae an intimate acquaintance, and hence need not he decribed here. It was thought hy many that this piece of flnming wae impoesible, and at leest fraught with euch danger ae to deter any man or set of men from working there, hnt not a eingle accident occurred, except in one caee, where the man himeelf wae more careleee than hie enrronndings juetified. Combining, ae it doee, heanty of deeign and strength of conetrnction, the flnme eeeme at a distance to he euepended in the air, and ie an endnring monnment to the skill and energy of ite projectors. It ie helieved that thie ie the only inetance of the kind in the hietory of hydraulic mining where a flume ie carried around a perpendicular cliff in the manner ahove described.

The engraving shown on page 56 repreeente a portion of the hracketed flume, hy which the conetruction can he nnderetood. The engraving on this page givee a general view of the hracketed flnme where it passes around the vertical wall. Thie also ehowe where a etream from above peesee over the flume. An "apron" hae heen put up at the point, to keep any of the water from the fall coming into the flnme. The treetle work shown is 86 ft. high; but in the line of thie ditch, a treetle 136 ft. high has heen hnilt. There ie one place on the ditch where there ie a piece of trestle-work 1,088 ft. long and 80 ft. high—eaid to he the handeomeet piece of work of the kind in the State. The ditch and flume itself ie 33½ milee long. The flume hae a carrying capecity of 3,000 minere' inchee.

ELECTRIC LIGHTING FOR MINES—In a paper read hefore the Inetitntion of Engineers and Shipbuildere in Glaegow, hy Principal Jamieson, of the College of Science and Arte, it was etated that 1,400 or 1,500 lampe for electric lighting had heen fitted up in different large steamere, including *H. M. S. Inflexible* and eome firet-claee paeeenger steamere. He decribed in some detail the conetruction of the Swan lamp and the manner in which the 117 lampe on hoard the *Servia* were fitted up, at a coet of ahout £1,000, or eight guineas per lamp. He remarked that ae yet the electric light wae only ueed in two collieriee—at Earnock and Risca. The mine-ownere were very cautious, and were waiting to eee whether the experiments at theee two places proved enccesefnl. The lamp need in theee collieries wae ae safe ae poeeihle in the moet explocive mixtnre, hnt it had ite drawhacke, and he did not think that in ite preeent form it had any great future hefore it.

TRACK-LAYING. — During 15 daye of this month, the Sonthern Pacific railroad company built and laid, on the eouthern extension of ite road to New Orleans, 145,285½ ft. of track, equal to a fraction over 27½ milee. The longeet distance of track laid during that period in one day was 21,000 ft., or a fraction under four milee. Up to Saturday laet track had heen laid 207½ milee from the eastern end of the Rio Grande bridge, or 203.63 milee eaet of El Paeo. The railroad is running through a comparatively unsettled portion of Texae, hut a line of towns is springing np along the track. One advantage to the conntry is the discovery of water in various localitiee, thue eupplying a want that hae retarded the development of that part of the State.

THERE are 81 mining dietricte in Utah, all of which ehould produce increaeed [quantitiee of ore this year.

Relocation of Placer Claims.

The United Statee lawe which require an annual expenditure to he made on quartz claime, on pain of forfeiture hy relocation, do not require any expenditure on placer claims. Still, under certain circumetances, placer claime can he relocated, viz., where the *local* laws require annual expenditures, and theee expenditnree are not made.

Thie principle ie very clearly etated hy the U. S. Land Commiesioners in a caee where some people proteeted against a patent heing granted to one J. P. Sears for a placer mine in Colorado on the gronnd that $500 had not been expended on the claim. The protestants etated that for the paet ten years, Seare had made no expenditnre for labor or improvements connected with plecer mining upon the premieee applied for; and that neither Seare nor his grantore had expended $500 npon the claim for placer mining pnrpoeee, nor any sum to exceed from $50 to $75, the excavatione, pite, ehafte, cnte, waterboxee, pipee, etc., represented on the plat of eurvey, and referred to by the depnty mineral-snrveyor in the field notee, having heen conetructed and ueed for the pnrpose of supplying certain bathing-housee owned hy Sears *et al.*, with hot water from the hot epringe which flow upon the land; and that conesqnently the certificate of the Surveyor-General that $500 had heen expended upon the claim for labor and improvements was erroneone, the said expenditures not having hsen made for the purpoees contemplated by the act.

The land office did not coneider theee objectione to he pertinent matters of inquiry, and the decision eays: "In the firet place, if Parker and Taylor claimed portions of thie land, it was their duty to have filed adveree claime in the manner and at the time preecrihed hy Section 2325 U. S. Revised Stetutee. They fail to etate when their alleged adveree righte accrned. Secondly, it doee not matter whether Sears hae performed any placer mining work npon the premieee eince the date of application for patent or not, provided no pereon has made a relocetion of the eame. If the local lawe of the miners, or the etatutee of the State, require a certain amount of expenditnree to he made annually in order to maintain a possesory title to a placer claim, undoubtedly a failnre to comply with this requirement would render the land subject to a relocation hy any qualified pereon; hut no relocation was alleged by proteetante."

Two minere crossing Kanaka creek, Sierra county, eaw a gold nngget lying in the creek, and further prospecting resulted in their unearthing three hundred dollare' worth of nnggets. It is thought the gold must have heen loet in the creek yeare ago.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Ede.

Barker Mining District, Montana.

EDITORS PRESS:—This district, discovered ahont two years ago, has assumed considerable importance dnring the past few months and hids fair to be the coming hoom. It is situated in the Bell rangs of mountains, abont 75 miles sontheast of Fort Benton, in Msagher county, near its northern limits. Several hundred locations hsve been made, but ths developments are of the most superficial character save upon ahout half a dozen of them. The country surronnding the mines is dsnsely timhered and well watered. Iron ore is abundant and limestone also.

The Country Rock

Is primitive granite. The gsneral character of the ores of the district is argentiferous galena mixed with qnartz, and iron and copper pyrites, some of which carries considerable gold. There has heen discovered hut a few prospects that show fres milling ore, though some very fine bunches of chloride, horn silver and hlack snlphurets have heen fonnd, and thess will doubtless lesd to some good finds of that class of ores. As before stated, the amount of development has not amounted to much. It is, therefors, impossihls to form more than a mere conjecture of the value of the district as a whole.

The Barker, the Oldest Location,

Is also in the van in devslopment. Ths lode has been cut hy a fifty-foot tunnel and a level extended along the oro body for a similar distance, and this is pushed as rapidly as possihle. The mountain is so steep that ons foot added to the level gains nearly that much in depth. A shaft is being sunk that has attained a depth of 55 ft.—30 helow water level. It is to he continned to a depth of 100 ft. when levels will he rnn and stoping begun in earnest. The ore is hanled to the smelter as fast as taken from the mine. There is a compact body of ore fivs ft. in width. The walls are smooth, hard, and as well defined as could bs desired. There is no longer a douht that it is a true fissure vein. The work of development is carried on under the immediate supervision of Paris Gibson, Esq., who has the Barker honded, but for what sum I did not learn. The owners appear to think they have made a bad bargain, and in that I fnlly agree. Its location is so favorable for dsvelopment and permanent workings that it must always he a leading mine of the camp. Ore from the mine shipped to Omaha netted over $100 per ton. Tbis is certainly a good showing for a 20-ton lot not closely selected. In this connection it must be horne in mind that before starting on its long voyage down the mighty Missouri, it was hanlsd in wagons over 250 miles.

The Wright & Edwards

Stands next in point of development, though taking the amount of money spsnt upon it into consideration, it should have heen the first. Ths work has heen virtnally expended on the surface, hut in so many places and even nncovering large bodies of first-class ore, that it cannot he said to havs been expended in vain. Levels have been driven each way from a crosscut ahout 30 ft. heneath the surface, and a force of men are now engagsd in stoping. A tnnnel is hsing rnn that will cut the lode at a depth of 150 ft. This will he pushed forward rapidly, and the mine dsveloped systematically, as it is now in the hands of practical miners hacked with ahundance of working capital. This is the only incorporated mine in the district. It gives promise of heing among the lsading mines of Montana in a very hrief time. All the ore taken from the mine is delivered to the smelting company for reduction. The dnmp contains several hundred tons of ore, and it is believed that this mine, in conjunction with the Barker mill, can keep the smelter running constantly. A 30-ton lot of average ore from this mine, shipped to Omaha, netted $113 per ton.

Other Mines.

The Benton hss been opened by a 75-ft. tunnel rnnning along the vein. The wall rocks are well defined, and ths dump shows a large amonnt of low-grade ore. The ore shipped yielded about fi7 ozs. of silver per ton. There ars many others that show equally well for the amount of dsvelopment upon them. The most noteworthy of those that csme under my ohservation are Pittsburg, Keystone, Qnesn of the Hills, Vanderhilt, Silver Bell, Summit and De Soto and Meeks. There are hundreds of other locations, many of which will doubtless prove equally promising when hetter developed.

Svveral villages have aprnng up along Galena creek, and named as follows: Gold Run, Hughes City, Galena City, and Meagher City. Many houses are under way, and no doubt that ere one year elapses, they will all he thriving burgs or consolidated into one or two respectable sized villages. The present outlook for the Barker district is more encouraging than has been any other in Montana with the same development.

One Smelter has been Erected by

The Clendenning Mining and Smelting Co. The roasting furnacea and crushers have heen in operation for some weeks, and the hlast furnace will he started up about the 10th of January. The motive power is a 40-horss sngine with two boilsrs, only one of which will he nsed, the other kept in reserve for an emsrgency. The machinery consists of two Blake crnshers, one psir Cornish rolls, a No. 5 Baker blower, two roasting furnaces 47x12, and one water-jacket hlsst furnace. The building is a frame 65x110.

The process is that of roasting and reduction, the same as is in vogne in Freiherg and other parts of Europe, and extensivsly oopied in varions parts of the United States.

The works have heen erected under the immediate supervision of Prof. Foes, a gentleman who has had mnch experience in snch matters, having previously constrncted 11 similar to the one just completed, all of which have proved successful. The mschinery is of ths most approved style and most durable character. Prof. Foss will remain as a permanent fixtnre in manipulating the ores, etc.

The whole is nnder the general supervision of Col. George Clendenning, Jr., a thorough husiness man as wsll as a pnblic spirited and enterprising citizen. YEBREK.

Gold Run, Montana, Dec. 2fi, 1881.

Arizona.

EDITORS PRESS:—I am now some 70 miles north of Tucson, 40 east of Florence and ahout 40 southeast of Globe, at the jnnction of ths San Pedro with the Gila river. These rivers above here, are said to be unhsalthy; hnt right here, it is the healthiest plscs I bavs fonnd in Arizona. At Tucson, two autumns, I had a spell of chills and fever; here, no trouhle at all. I came into the neighborhood on acconnt of ths coal fields; and ths people wishing me to teach their school this winter, I cousented. I have had a tims of it. Ths Indian outhreak took place two weeks after I hegan, and scared most of the families away for three wesks. It was a rather unpleasant condition of things. I remained, hoping ths trouhls wonld soon end. There were a nnmher of miners stopped at the same place, and we carefully kept ten guns ready for defense at a moment's warning. Our mail carrier stopped his weekly visits at the time, and we could gst no news for so long that the suspense was dreadful. Then, when it was supposed all was orderly again, ths families retnrned, school hegan, and another outhreak occnrred. Terror seized the peopls again; and though thsy didn't leave this time, some did not come to school, whils those that did, carried deadly guns with them. It reminded me of the early history of Esstern settlements, where people carried their guns to church. Hsre ws fesrsd each day thst

The Redskins

Would come like a whirlwind and he upon us all of a sudden, when we intended to stand them off as well as we could.

As thers was a family and a numher of miners stopping there, a quarter of a mile from ths schoolhonse, and as they had made a fortification on a small hill nssr, we believed we could drive away 100, or more. But as the Indians are furnished with the most improved guns and abnndance of cartridges, we had reason to fear that some, or all of us, wonld hite the dust.

Oh, it does seem cruel that people must live in such terror of lswless savages, fattened at Government expense, furnished with the most deadly arms, and quartered nsar by ns hers, where, whensver they choose, they can make a sally, and carry death, destruction and ruin wherever they go.

I suppose every one of the 4,000 Indians at San Carlos reservation knows all about the condition of the families on the rivers from Florence up to Willcox, and heyond. Ths restless creatures, not satisfied to remain in idleness (and no wonder), have heen roaming all ovsr the country, sometimes over 50 passing at once, dnring the summer, before the trouhle.

What a blessing it would be to the Indians, as well as to the country, if all could he moved to the Indian Territory, where it seems to civilize them to sttle down and make homes. This part of the country most earnestly desires snch a thing as thsir removal, and the way it has heen, it would hs an immense saving to the Government.

A Valuable Country

Lies right in this neighborhood. I can show why. The soil on the river hottom is exceedingly fine, well adapted to grain, vsgetahles and fruit. Three of the neighbors havs gone into raising fruit—W. D. Herrington, W. A. Cnnningham, and, most extensively, W. A. Lattin, who has over 2,000 trees, apple, pear, plum, apricot, peach and other trees, and I must say that although I am, to a considerahle extent, a tree man, I never saw so fine a growth in any place I have been. His peach trees are planted 16 ft. apart, and although only three years old from planting, many of them nearly touch each other. I have been privileged to taste some of the peaches this year; and, again, I must say I believe them to be the finest I ever tasted. Crawford'a Late, in Los Angeles connty, Cal., was to me too *sour*; here, if anything, too *sweet*. The hot snn here seems to hring them to ahsolnte perfection, in size, beauty and flavor. Then, here are potatoes (Irish and sweet), corn, squashes, beans, onions, tomatoes, and everything nearly. Watermelons—oh! so large and so fine!

In addition to the value of the fine land lying along the river for cultivation, each farm has an immense range of fine pasturage for cattle among ths hills on each side of the river. Owing to the tremendous rains this summer, the grass has grown enormously, there being enough now for a thonsand to one of the numher hers at present. Of course the farmers on the rivsr are taking advantage of this, and increasing their stock as fast ss they can. The grass is of vsry excellent qnality, making flesh on the cattle, and the swsetest, richest milk. This place enahles one to rsvel in the bsst of vegetahles, milk, huttsr, sggs and ths lik; and soon the finest of fruit. Fruit trees are not old snough yet to bear ahundantly, for remember, it has heen but a few ysars since the dreaded Apache hindered any ons from venturing to rest his foot here, much more making a boms and planting trees.

Valuable Mines

Of gold, silvsr, copper and coal lie on each side of the rivers. Only 15 to 20 miles to ths east of us, ars the immenss heds of coal on Deer creek, some of them 10 ft. thick, and a very fine article for all purposes.

A copper mins, or mountain, as it may be called, a few miles up the Gila, and not far from the coal beds, was honded some time since for $200,000, I am told. Lately a ditch has heen taken out from the Gila just helow the month of the San Pedro, which is intended to rnn a qnartz mill. Now with smslters for copper, and perhaps for silver as well, with coal so near; with the famous Saddle mountain silver mines in sight; with other mines up south eight miles, from which two mules can draw down two of three tons; with a railroad in the near future, connecting the plscs with ths rest of the world; ons can ses, with his ayes shut, that this will bs a very important place when it is once uudsrstood that there is no fsar of Indians. What a mercy, therefore, to psopls who will live here, to have these merciless wretches removed, who do no good here, sven for themselves, and who are millions of dollars yearly a detriment to the country. H. H. MESSENGER.

Riverside, Pinal Co., A. T.

Fancy Mine Superintendents.

The following article, from the Reno *Journal*, is so timely and so just in its exposition of the mine management as it appears in Nevada, that it onght to he read carefully:

A mins is sold in soms Eastern city, money raised to prosecute developments and erect suitable machinery. Of course the first thing is the selection of a supsrintendent. In plscs of sending some careful business man who is interested in the propsrty out to ths mins, and have him employ a miner who hss learned the trade hy working at it, it is the custom to pick up soms pretty smart chap who happens to he out of employment, pay bim two or three times what a capahle man could hs got for on ths ground, furnish him with plenty of money and send him ont. Hs arrives at ths mine, and the first thing hs thinks of is to provide for his personal comforts. Hs huilds a handsome residence, furnishes it in style, purchases a nice huggy and fine pair of horses, hires a foreman and hookkeeper, and now he is ready for business. All this takes money, and in most mining districts a good deal of it. Thsre may not bs ore enough in sight to keep a five-stamp mill running, but this nice kid-gloved supsrintsndent does nothing hy halves—no little prospecting trip for him. So he goes to work and puts up anywhere from 20 to 40 stamps. Ws know of one instance in which a very large mill has been built at an enormous expense, and we have heen repeatedly told by miners from the district that when the job was commenced not a pound of ore had ever heen seen in the mine—in fact, all the mine thsre was consistsd of a hole ahont 15 ft. desp full of water. Of courss the mill is idle and likely to remain so. There ars mining operations going on in several plsces in this State under the direction of fancy supsrintendsnts that are standing jokes among the miners of the sections where they are heing done. Ths effect of this needless waste of money is to condemn mining as a legitimats bnsiness at the centers of capital. That there have been a large numher of worthless mines sold in the East; that millions of dollars have heen uselessly expended, is not the fanlt of ths mines; bnt for the wsnt of decent care in the purchass and decent management afterwards.

THE MCCRACKIN CO.—The Arizona *Democrat* says: Ths McCrackin Co. havs bought off the parties who jumped their gronnd, paying them $3,000 for their right and title. They have already put a force of men to work on the mine. Many of the old shafts and tunnels have caved in, and it will bs soms time before the property is in shaps for systematic working. So soon as the claim is in a condition for the extraction of ore, it is the intention of the company to start nn their mills. We have always considered the McCrackin one of the hest mines in the country, and there is no reason why, with careful and economical management, it should not be one of the best paying properties in Arizona. Its former failure was owing entirely to reckless and expensive manipulation. It is one of the largest ore hodiea in the Territory, easily reduced and with wood and water close at hand.

FRUE ORE CONCENTRATOR.—Of the many machines invented for the working of sulphuret ores the Frne is the most nsed. No other is in use in the Greenville district. It gives entire aatiafaction to all who have tried it here.—*Greenville, (Plumas Co.) Bulletin.*

Idle Mills in Arizona.

The Arizona *Democrat* says: A stranger visiting the mining camps of Yavapai for the first time, is struck with ths numher of idle mills and reduction works lying idle, which he encounters in nsarly every district in this county. He naturally inquires, why is it, that if our mines are as rich as ws claim them to hs, such a condition of things should exist. The question can hs more sasily asked than answersd; and the well-meaning attempts of eoms persons to mest the pertinent qnery, has not given satisfaction eithsr to the anxious inqnirsr, or to our own peopls. From a rssidence and experience of 10 years in the mines of northsrn Arizona, we shall attsmpt in this short article to show, why, and how, this state of affairs has besn hronght abont.

The first mining in this part of the Territory was altogether for gold. When ths rich surface deposits wers exhausted, ledges were located, and as depth was rsached, the free gold quartz changed to snlphurets. Eastsrn capital was snlisted to put up stamp mills to reduce these rehellious ores. Quartz mining was then in its infancy, and the ingenious and elahorate appliances for ore reduction of the present day were not known. As a consequence, the attempt to work hase ores hy the free milling process did not pan out vsry successfully. This was our first failurs. After the peaos with Indians, in 1875, mining received a frssh impulss in this county. But, unfortunatsly for us, the class of operators who came hither wers of the kind which any mining country can wsll sfford to do without. Possessing nsither honor, nor honesty, integrity or ahility, their only ohject was to feather their nests at ths expsnse of confiding frisnds on the "outsids," and guilelsss mine ownsrs hsre at home. They honded mines, erected mills, and after they msde a good "clean-np," departed snddenly for fresh fields and pastures new. Capitalists swore there was nothing in the country, while ths honest miner indulged in more original profanity ovsr the manner in which hs had heen hilked hy the unctious "expert."

The last count we shall alluds to, is that of failures caused hy our own mismsnagement and want of sense. Ths Peck and Senator will point our illnstration. Both of thsss fine properties should he paying to-day. But ignorant and stupid management has stopped ons, and litigation, brought on hy a lack of common sense, has cast a hlight over the othsr. Both are cases in point, where men had good things and didn't know it. Both remain as silent and impressivs monuments to idiocy and pure cussedness; to ignorance and gresd; to thick-headedness and downright dampboolery. It had heen said that that ths cause of ths stoppage of one of them was on account of litigation. Agrssing that it was, who first hegan this litigation and what caused it? Where did the legal fight first originate, and what was tbe germ of the trouhle which has etopped ons of the bsst mines in this Territory? Poor Bill Cols, who hss long mouldered in his silent grave, would bs a competent witness to answer if he could he reached through Dsath's eternal portals.

We have here alluded to the causes which havs retardsd our mineral dsvelopment.

Ignorance, mismanagement, rascality and fends among onrselves have heen the factors. We hops and trnst that our people will learn by experiencs, and that, with the hrighter day which is at hand, ws shall profit hy the mistakes of the past snd learn wisdom for the future. The next mining hoom in Yavapai promises to bs ths turning point in our history; if we ars wise we will avoid the rocks on which our past hopes were shattered.

MR. BENNETT'S NEW STEAM YACHT.—James Gordon Bennstt's new iron steam yacht wae launched the other day at Newbsrg-on-the-Hudson. There was no christening ceremony, a cable dispatch from Mr. Beunstt having heen received to the effect that he had not yet found a suitahle name for her. The yacht is 237 ft. over all, 26 ft. heam, and 18 ft. deep. She is to be rigged as a three-masted schoonsr, with pole topmasts. Her bunkers will contain 150 tons of coal. The propsller shaft is 11 inches in diameter, and the propeller 15 ft. fi inches, with 18 ft. pitch, which is calculated to give her a speed of 14 knots per honr. The interior fittings will bs most magnificent, ths cabins and saloons being forward of the engines, and the qnarters for ths officers and crew abaft. There are nine state-rooms forward, besides Mr. Bennett's room, and a ladies' cabin forward of the main saloon. It will tske about thres months to finish her. She is the largest yacht that has ever bsen bnilt in this country, with the exception of one built at Baltimore last year for M. Henri Say, of France.

OVER ONE MILLION DOLLARS.—A letter from Capt. Guyer, Superintendent of the Custer mill, says: "We have just molded our last bar for 1881, which foots up $1,002,183.18 taken out since Feb. 1, 1881, 11 months' run. The mill is in splendid condition." The letter was addressed to George M. Parsons, Esq., of this city. The above showing is enough to convince the doubting Thomasea of the sort of mineral property that ia to be found on Wood river and its tribntaries.

THERE is a good deal of travel to and from all the Eastern towns and mining camps over the Carson and Colorado. Persons passing over the ronte are loud in their praise of the road as one of the smoothest running in the country.

MECHANICAL PROGRESS.

The American Locomotive.

John Roach, the eminent American ship builder, in a recent address before the late New York Tariff Convention, said: "Now, I want to call your attention briefly to what we have done in building the locomotive. That will show the development of another American industry. Fifty years ago, we imported a locomotive engine from England, as a sample. I made an examination some time since as to the number of locomotives now in the United States, the cost of their construction, and how it compares with the cost of construction in other countries. The number of locomotives in use in this country Jan. 1, 1879, was estimated at 16,445, valued at $164,450,000. The number of cars in use, not including palace cars, was estimated low at 498,000, which would cost at least $600,000,000, making the value of locomotives and cars together $764,450,000. Besides, as much as one-tenth of the total now running must have been rebuilt, say five times, since 1830, at a cost of $382,225,000, making a grand total of $1,146,675,000, which is more than England has invested in ships. But besides this, we have built locomotives for export to all parts of the world, owing to the recognized superiority of the American locomotive.

"The Baldwin Locomotive Works alone sent out of the country from 1870 to 1880 over 520 locomotives, 152 of them to English colonies; and of all the locomotives used in the English colonies from 95% to 98% were built in the United States.

"The United States have exported since 1870 $20,000,000 worth of locomotives and double that amount of cars.

"We have been succeeded in building locomotives of such quality and at such prices that we have taken England's locomotive business away from her in her own colonies. Is there any reason why, when our ship building shall be equally encouraged and developed by extending our trade and making a demand for it, we should not build ships for those countries which have not the resources to build them for themselves?

"But then we are told that while we can build the locomotive and car we cannot build the ship, though that is built out of the same material and from the same forest and mine, and though the labor required to convert 100 tons of pig iron into locomotives is much greater than it is in the finished ship and just as high priced. But we had a policy for building the locomotive, by finding a use for it, and you see the result."

How Closely Does a Machinist Measure?

In connection with the question of standard gauges and measuring instruments of perfection, it is interesting to notice how closely the machinist works with the *ordinary* tools of his trade.

Some little observation of a workman engaged in boring locomotive driving wheels and fitting shafts to them, led to the following:

The wheels were bored with a tool, and of a taper of 1.64″ in 7″. They were bored in a remarkably good lathe, but not to *exactly* the same size. A certain distance was fixed upon as proper for the wheel to be forced on the shaft, after allowing the shaft to settle into the wheel (which was laid down on the floor) by its own weight, and the workman would not make a variation of more than $\frac{1}{32}$″ in that distance.

Making allowance for want of truth in the hole and shaft (although it was extremely difficult to detect any variation), it is safe to say that the machinist was working within 1-4000th of an inch. To do this, he must first measure the hole in the wheel with his caliper, transfer that measure to another pair of calipers, and again transfer that measure to the shaft he was turning. Making allowance for the fact that a machinist cannot turn as fine as he can measure, it may be safely concluded that he will work so closely, that the variation will be scarcely noticeable in a fit. However closely he may work, the fact should not be lost sight of, that he cannot define the size to which he is working, without the use of some sort of a measuring instrument of perfection. In other words, he can work almost infinitely closer than he can measure, by the use of ordinary tools.—*American Machinist.*

A FRENCH EXPERIMENT IN SHIP-BUILDING.—During the French blockade by the English fleet, Napoleon established a maritime arsenal in Venice, where a number of vessels were built. One day a brig, upon which great expectations had been founded, left the port without having time for trial; but it sailed so slowly that it was captured by an English ship before it reached the open sea. The French crew was replaced by an English crew, which was soon disappointed at finding that it was almost impossible to move the brig. Upon examination it was suspected that the principal mast had been badly stepped. Carpenters were called, who gave the mast a greater inclination, and after spreading the sails anew, the brig was found to be a faster sailer than any other in the English fleet.—*Les Mondes.*

The Position of the Skilled Mechanic.

No matter to what extent the refinement in machine tools may be carried, it is in the end the careful and painstaking operation of the skilled mechanic that must bring the products of these tools to a perfection that will meet the requirements of modern demands. The lathe will not turn so round that, in this respect, its production cannot be improved by the hand-work of the skilled machinist, nor will the milling or planing machine produce surfaces so true that he is not called upon to rectify them with the file and scraper. Now, as ever, the beautiful finish on iron and steel is the result of the individual effort of the operator, rather than of the perfection of tools.

Years ago the opinion prevailed to a considerable extent, that the services of the highly skilled mechanic would not be so much a matter of necessity in the future as in the past, but those who built on such grounds built poorly. The man will always be superior to the machine, and must always see better than he can perform.

One man may direct the efforts of 50 skilled workmen to the production of good work, but 50 men cannot get good work from one unskilled workmen. Improved tools and mechanical appliances will simply assist the artisan in the production of fine work, but the greater the refinements of these tools and appliances, the greater must be his skill. Instead of relieving him of his responsibilities, which would be in every sense a misfortune, they add to them, which makes him, in every way, the better, in being able to meet them.

Altogether, the position of the skilled mechanic is in every way satisfactory, in its relation to improved machine production, and the tools and appliances of the future, however refined, can never usurp the place in the industries of the world, nor relieve him of the part he is to play in future mechanical advancement.

SILK VS. FELT FOR COVERING BOILERS.—It is well-known that silk is an excellent non-conductor of heat, and some recent experiments in Germany would seem to indicate that it might pay to encase boilers in this costly material. In one trial three boilers of the same size and make were ranged in order, one covered with the ordinary felt, another with a coating of silk only five-eighths of the thickness of the felt, while the third was left altogether uncovered. They were all filled with water having a temperature of 100° C., and examined at intervals. After a lapse of three hours it was found that the unprotected boiler had lost 12° of heat, and the other two each 2°. After a further lapse of 33 hours, the felt-covered boiler had lost 13½°, and that covered with silk only 14°, so that there was no appreciable difference between the protective powers of the silk and those of a casing of felt nearly twice its thickness. With regard to the cost of the material, it is said that in all the silk manufactories there are waste-scraps which it would be difficult or impossible to utilize in the trade. These can, it is asserted, be made up into bands and rolls, costing comparatively little, and sold at a profit to the makers and users of boilers. As to the lasting and wearing powers of silk as compared with felt nothing is said, and there has not, perhaps, been time to apply an adequate test; but it is at least possible that in this respect the finer substance may possess great advantages over the coarser and cheaper.

THE BEST CEMENT FOR LEATHER.—We have known $10 or more to be paid for a recipe for mending belts, similar, but not equal to this, which we clip from the *English Mechanic and World of Science:* "For making cement for leather belts, take of common glue and American isinglass equal parts, and place in a glue pot. Add water to cover the whole. Soak ten hours. Then bring the mixture to a boiling heat, and add pure tannin, till the whole becomes ropy or like the white of an egg. Apply warm. Buff off the grain of the leather where it is to be cemented; rub the joint surfaces solidly together; let it dry a few hours, and it is ready for use. If properly put together no rivets will be needed, as the cement is as strong as the leather."

SINGULAR MECHANICAL PHENOMENON.—Mr. Joshua Rose, in a recent issue of the *Mechanical Engineer*, says: "Sometimes a circular saw that has just been tempered and laid down to cool will commence to hum, and if it is not quickly replaced in the furnace it will crack. The humming begins in a low musical key, and rises in tone until it ends in a snap. The saw does not always crack through from the eye to the perimeter, and it never does so if it is got into the furnace while humming in a low tone. If the crack proceeds but a part of the way, it is from the bottom of a tooth or space and toward the eye. Saw makers are unable to explain the cause of this singular fact, which is a very costly one to them."

POROUS BRICKS.—The association of proprietors of steam engines in the north of France have made numerous experiments which show that many of the bricks that are employed in building furnaces are so porous as to allow an easy passage for the air. In consequence of these experiments they advise that no bricks should be employed for the purpose which are not very compact and refractory, and that they should be either glazed upon the outside or covered with an impenetrable varnish.—*Chron. Industr.*

SCIENTIFIC PROGRESS.

Nitrate Deposits.

The Chili nitrates, the real cause of the late "unpleasantness" between Chili and Peru—nitrate of soda—is found in great abundance on the desert of Atacama, a short stretch of country lying just north of Chili and on the extreme southern coast of Peru. These nitrates, are generally covered, first, by a bed of soil, varying in thickness from 4 to 10 inches, next by a compact layer of gypsum, immediately under which the nitrate occurs in irregular beds, from 2 or 3 to sometimes 8 or 10 ft. in thickness, and is found over an area of some 40 square leagues. It is often mixed with sulphate of soda. There is also another large deposit found at the Pampa del Tamaruagol, where it does not occur nearer to the coast than 18 miles. It appears to have been gradually transposed to salt as it approaches the ocean. It seems to have come from the decomposition of the felspathic rocks which form the central portion of the desert to the eastward of the nitre beds.

Nitrate of soda is artificially prepared by neutralizing nitric acid with soda and crystallizing the solution. It consists when dry of 36.6 soda, 63.4 of nitric acid. The contained water of chrystallization amounts to 9.47 of the combined substance.

The natural nitrates are refined by being broken into small pieces and dissolved in boiling water, when the earthy and insoluble matters fall to the bottom. The clear liquor is run into shallow troughs; where, being exposed to a tropical sun, it soon crystallizes. There are about 100 of these refineries scattered about over the nitrate territory.

The existence of this deposit was first practically brought to the attention of the world in 1820, when a small lot was shipped to England; but the duties on it were so high that the then known use to which it could be put would not allow of its being landed, and it was thrown overboard. Several other unsuccessful efforts were made within the next eight years to introduce it into England, France and the United States; and it was not until 1830-31 that it began to have a merchantable value. The latter year, it was sold in both England and France for from $150 to $200 per ton. It is used with other mixtures as a fertilizer of land, and for the manufacture of nitric acid. It is susceptible of all the applications for which niter is used, except for the manufacture of gunpowder, for which it is not adapted, in consequence of its deliquescent property. In its refined state, it often contains a small quantity of iron, and always a trace of iodine; also, common salt, sulphate and carbonate of soda, muriate of lime, and occasionally borate of lime. There are some four or five, mostly slightly different varieties, one of which—the most variable—composed of boracic acid, 49.5; soda, 8.8; water, 26.0; lime, 15.7=100, it is thought might be profitably utilized in the manufacture of glass.

ACTION OF COLD UPON THE VOLTAIC ARC.—D. Tommasi publishes the following conclusions from his experiments: When the voltaic arc springs between two metallic rheophores, each formed by a U-shaped tube, traversed by a rapid current of cold water, and placed horizontally near to each other, the following facts are observed: 1. The illuminating power of the arc is greatly weakened, being reduced to a simple luminous point even when a very intense electric current is employed. 2. The arc, if it can be called so, is very unstable; the least breath extinguishes it, and it cannot even light a match without being extinguished itself. 3. If a piece of paper is placed above the arc, and very near it, a black point is formed, which spreads and finally breaks, but the paper does not kindle. 4. The arc consists of a luminous globule, moving up and down between the two rheophores; the form of the globule as well as its extreme mobility reminds one of a drop of liquid in the spheroidal state. 5. If the south pole of a magnetized bar approaches the arc, it is attracted by the magnet and extinguished. The same fact is observed, but in the opposite direction, upon the approach of the north pole. 6. The quantity of ozone seems to be greater than when the arc is not cooled. In spite of the cooling of the rheophores, the flame is slightly green, which shows that a portion of the copper is burnt. Tommasi proposes to experiment with platinum rheophores, with alcohol cooled to 22° F.—*Comptes Rendus.*

GIGANTIC ALGÆ.—The Madras *Mail* contains an account, Capt. Taylor, of an enormous monster which he saw while at anchor in Table bay. It was more than 100 ft. in length, and appeared to glide over the water with an undulatory motion, like a serpent. Its head seemed to be surmounted by something like a long mane, and the observers who had the sharpest sight affirmed with fear that they could distinguish its features, and even its eyes. He collected the crew and directed a brisk fire of musketry upon the monster, at a distance of about 500 yards. When it seemed to have been seriously injured, and its movements were a little quieted, boats were sent out to examine it more closely and to finish its destruction. It was then found that they had been fighting a magnificent specimen of the giant herb of the sea, of which the undulatory motions were caused by the agitation of the waves near the shore.—*Les Mondes.*

Telephone Conductors.

In view of the fact that the postoffice authorities of London are contemplating laying all their telegraphic wires underground, it is interesting to know that an important economy in their cost, and in the space occupied by them, has recently been effected by Mr. Edwin Truman, of London, England. The invention has special reference to telephone conductors. It is now well known that to employ telephones with a good result, the earth must not be used for the return current, but that two wires must be employed, the one to send the current and the other for the return. To insure perfect freedom from induction, these two wires should be perfectly insulated and be equi-distant from all surrounding matter. In order to effect this, they must be twisted spirally on each other, so that each alternately takes the place of the other. This necessitates the use of two wires, and, of course, involves the cost of two, plus the twisting. Hence a difficulty, which, however, has been ingeniously overcome by Mr. Truman, who places the two wires in one covering, and keeps them apart and well insulated from each other, and yet arranges them spirally to each other. Considerable economy is thereby effected, firstly, in the materials used; and, secondly, in the space occupied, which is a most important item in underground work. Some of Mr. Truman's wire contains six separate conductors, insulated from each other by about 6,000,000,000 of units, and the entire six insulated from the surrounding water by the incredible quantity of 13,470,000,000 of units per statute mile. The core is of solid guttapercha of the highest quality, and its diameter is about equal to two of the present underground wires. This gives a core of the quality of which there can be no doubt, as guttapercha has stood the test of time in telegraphy. The saving to the public, moreover, will be great, as Mr. Truman states that he can make cables of any reasonable number of wires, and produce the same result, at a saving of at least one-fourth of the present cost.

THE MOVEMENT OF GLACIERS.—Messrs. Koch and Klocke made a series of measurements about one year ago to determine the rate and character of the movement of glaciers, using essentially the same methods employed in a previous series of observations conducted in 1879. Their first observations seemed to prove a considerable and unexpected degree of irregularity in the movement. It was found, for example, that the same point could have a motion in both a vertical and horizontal direction, and that two points not very far apart in some cases moved at a different rate, or even in opposite directions. The observations of 1880 have, on the whole, given a rather negative result, since, for some unknown reason, the motions measured were much smaller than before, those in a vertical direction, for example, hardly exceeding the unavoidable errors of observations. Messrs. Koch and Klocke concluded that the amount of observed movement, vertical and horizontal, often did not exceed the probable error, and hence their results do not allow of satisfactory discussion, but they, notwithstanding, indicate real ice movements, and are not to be wholly referred to irregularities in the position of the observing telescope.

TRANSFORMATION OF SOUND INTO LIGHT.—In 1879, a year before the invention of the photophone, M. Treve made an experiment which is the reverse of the photophone. A Fizeau condenser, consisting of sheets of paper alternating with tinfoil, was rolled and placed in a Geieeler tube, which was connected with an air pump. The current of a Ruhmkorff coil was passed into the tube, and a telephone was placed in the induced current. While the current was passing, the roaring of the electricity in the condenser could be heard in the telephone. If the pressure of the air in the tube was gradually diminished by the air pump, the roaring subsided; when a vacuum of two or three millimetere (.079 to .118 inches) was reached, the noise ceased altogether, and light began to play against the leaves of the condenser. It was not the well-known vague and diffuse light of the Geissler tubes, but a special, condensed, pearly radiance. It was necessary that the electricity should be manifested in some way, and as it could not be transformed into sound, on account of the rarefaction of the air, it was changed into light.—*Les Mondes.*

INFLUENCE OF TELEGRAPH WIRES UPON BIRDS. In the neighborhood of the pine forests of Norway the telegraph posts which have been freshly impregnated with sulphate of copper are often found to be entirely perforated by the woodpeckers. The resonance, which is produced by the vibrations of the wires, leads the bird to suppose that there are worms and insects in the interior, and holes are consequently made which are sometimes as large as a man's arm. They are generally found near the insulators.—*La Nature.*

DIFFUSION OF ELECTRIC LIGHT.—M. Clemandot was induced, by observing the diffusion of the solar light by clouds, to experiment with mineral wool, or spun slag, in connection with the electric arc, and found that it seemed to absorb the light like a sponge, so as to make from 75% to 80% available for illumination, while the ordinary processes utilize only from 45% to 50% at the most.—*La Nature*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jan. 5.		Week Ending Jan. 12.		Week Ending Jan. 19.		Week Ending Jan. 26	
Alpha	2	....	2	1½	1.80	1½	1.85	1.60
Alta	4.35	4.15	4¼	4.05	4.65	4.10	5⅜	4.55
Andes	80c	70c	80c	55c	1	80c	90c	85c
Albion	1.90	1½	1½	1.60	1.90	1½	1.90	1.80
Argenta	....	....	....	....	....	....	....	....
Addenda	....	....	10c	....	10c	5c	....	....
Belcher	1.85	1.60	1.55	1.35	1½	1½	1.45	1.30
Belmont	....	....	65c	....	75c	....	85c	75c
Best & Belcher	77½	73	73	66¾	75	67½	75	74
Bullion	1.30	1½	1.20	85c	1	50c	90c	80c
Bechtel	....	....	35c	30c	50c	40c	50c	35c
Belle Isle	....	....	....	....	10c	....	20c	5c
Bodie	2½	2.45	2½	1	2½	2.45	4.10	3.35
Benton	75c	....	75c	65c	80c	70c	1.10	70c
Bulwer	2.90	2½	2.60	2½	2.60	....	2½	....
Boston	60c	50c	60c	....	50c	....	....	....
Black Hawk	....	....	....	....	5c	....	10c	5c
Belvidere	....	....	....	....	....	....	10c	....
Booker	....	....	....	....	....	....	....	....
Caledonia	....	....	30c	25c	30c	25c	30c	....
California	35c	30c	35c	25c	40c	30c	37c	25c
Challenge	60c	....	50c	40c	60c	55c	55c	....
Chollar	1.20	1.05	1.15	85c	1.10	....	1.20	1.10
Confidence	2¼	2.05	2.05	2	2	....	1.95	1.85
Con Imperial	....	....	6c	....	5c	....	....	....
Con Virginia	1.10	75c	90c	70c	1¼	1	1.15	1.05
Crown Point	1.15	1	95c	90c	95c	75c	90c	75c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	10c	....
Concordia	1½	1.40	1	80c	95c	90c	....	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	20c	....	35c	25c
Derbec	....	....	....	....	....	....	....	....
Day	1.80	....	1.65	1	1	95c	1	....
E. Mt. Diablo	40c	35c	35c	....	50c	35c	50c	45c
Eureka Con	13	12½	13	....	14	13	13	....
Exchequer	1	90c	90c	75c	75c	70c	75c	65c
Endowment	....	....	....	....	....	....	5c	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	2.30	1.95	2	1.90	2.20	1.90	2¼	2
Goodshaw	25c	....	15c	....	25c	....	45c	40c
Gould & Curry	4.05	....	3.40	1.10	3.60	4	3.80	3.80
Hale & Norcross	1.70	1.40	1.35	1½	1.45	1.20	1.30	1.20
Head Center	....	....	....	....	50c	35c	90c	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	10c	....	10c	5c	....	....	10c	5c
Justice	70c	60c	65c	55c	75c	65c	75c	80c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	....	....	....	80c	....	....	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	5c	....	....	....	15c	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1½	1.40	....	....	1½	....	1½	....
Martin White	....	....	2½	....	2½	21	23	....
McClinton	....	....	....	....	....	....	....	....
Mono	70c	40c	80c	55c	70c	....	1.35	1
Mexican	10	9½	9¼	8½	10½	9¼	10¼	9½
Mt. Diablo	7	6½	6½	6½	8	7½	8½	7⅜
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	30c	15c	15c	5c	10c	....	10c	....
New York	....	....	....	....	....	....	....	....
Northern Belle	8½	8½	8	7½	8½	7½	10	8½
North Noonday	25c	5c	5c	....	25c	....	10c	5c
Navajo	35c	....	30c	25c	35c	40c	65c	55c
Occidental	1	95c	....	....	....	....	....	....
Ophir	6	5½	5⅞	5⅜	6½	5⅜	6⅜	5⅜
Original Keystone	....	....	....	....	....	....	....	....
Overman	1½	1.30	1½	90c	1	90c	1.20	95c
Oro	20c	15c	15c	10c	1	10c	15c	10c
Paris	....	....	....	....	....	....	1	....
Potosi	1½	1.40	1.40	1½	1½	1.35	1.45	1.40
Queen Bee	....	....	....	....	....	....	5c	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	2	1.45	1.40	1½	1½	1.35	1.60	1.30
Seg Belcher	3½	....	1.90	....	....	....	....	....
Sierra Nevada	9⅝	8½	8	7½	8½	7½	8½	7⅝
Silver Hill	20c	15c	15c	10c	20c	10c	25c	20c
Silver King	19⅝	19½	19⅝	19½	19⅝	19½	19⅝	19
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	1.15	1.05	95c	90c	1	90c	1	95c
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	5c	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	20c	....	....	....	20c	....	....	....
Tioga Con	10c	....	8c	....	....	....	15c	10c
Tiptop	4	....	4¼	4.70	5	4¼	4¼	4½
Tuscarora	....	....	....	....	....	....	....	....
Union Con	15	13½	12½	10⅞	11⅝	10½	11⅝	10⅜
Utah	6⅜	6	5½	5½	5⅝	5⅛	5⅝	5⅜
Ward	3½	....	3¾	....	3¾	....	3.60	3⅜
Wales	55c	50c	75c	60c	70c	....	80c	75c
Yellow Jacket	3.40	3.05	3.10	2½	2.90	2.60	2.90	2.60

Sales at S. F. Stock Exchange.

Thursday A.M., Jan. 26.

50	Alpha	480	Union@11⅛
835	Alta@5⅛	30	Utah@5⅛
230	B & Belcher	100	Ward@3⅛
130	Belcher	120	Yellow Jacket
225	Benton@5⅝		**AFTERNOON SESSION.**
380	California@25c	100	Albion@1.90
200	Con Virginia	950	Addenda@8c
50	Crown Point@90c	200	Belmont@80c
150	Confidence	50	Bodie@3.05
130	Challenge@55c	80	Bulwer@2.25
250	Caledonia@3	100	Concordia@85c
285	Exchequer@70c	200	Day@1
120	Gould & Curry@3.85	100	Eureka Tunnel@1½
555	Hale & Nor@2.30	1290	Goodshaw@60c
265	Justice@1	105	Manhattan@1½
300	Lady Wash@15	100	M White@2
745	Mexican@10⅜@10⅝	200	Mono@1.05
50	Ophir@6	160	Northern Belle@9⅛@9⅜
130	Overman@1.15	145	Noonday@10@5c
100	Regent@10c	100	Oro@15c
200	Savage@1.60	150	Queen Bee@5c
340	Sierra Nevada@7⅞@7¾	700	S Bodie@8c
30	Scorpion@1	50	Tiptop@4½

Casualties with Explosives Reported During Last Year.

[Collated from reports in the daily press.]

January

16. Ashen, Col.—Ons man killed hy explosion of dynamite.

18. Bradford, Pa.—Employee of Roberts' Torpedo company torn to pieces hy explosion of 4 lbs. of nitro glycerine; had it in a can, when hs slipped and fell.

March.

4. Eureka Powder Works, near Berkelsy, Cal.—Explosion of works, causing death of 3 msn and serious injury of S.

April.

2. Wilkesharre, Pa.—One man killsd and one injured hy explosion of a dynamits cartridge; heavy loss of property.

11. Thunder Powder Works—Explosion at Thunder Powdsr works, near Melrose, Cal., foreman of works maimed and building shattered.

18. Tonite Cap Factory, near Berkeley, Cal.—One Chinaman killed in making fulminats of mercury.

21. Union Metallic Cartridge Co., Bridgeport, Conn.—1,000 kegs powder in magazine; large damage to property.

21. Dittmar Powder Works, near Binghamton, N. Y.—Explosion of works; heavy loss to property.

May.

28. Martin Whits tunuel, Ward, Nev.—Minsr suffocated and rendered nnconscious hy Giant powder fumes; whils in this condition two charges sxploded near him; hs was rescued more dead than alive.

31. Dalles, Oregon—Two men killed and one injured hy premature explosion of giant powder.

June.

2. Leadvills, Colorado—Two children hadly injured hy explosion of Giant powder cartridge.

7. Utah, Pascoe's Quarry—Heywood, agent of Thunder Powder Co., frightfully injured hy ramming a cartridge of Thunder powder into a hors-hole.

10. Bechtel mins, Bodis, Cal.—Ons man killed hy explosion of Giant powder cartridge.

13. Westchester, N. Y.—One man killed and one shockingly mutilated hy explosion of nitroglycerine.

27. Clark's Landing, Alameda Co. — Alta Chemical Co., manufacturing chlorate potash explosive; works burned; thres men injured.

27. Tucson, Arizona—Powder magazine containing Giant, Hercules and Vulcan, Tonite, black and sporting powders. Great damags to property.

July.

10. Cherry Creek, Nevada—One man killed and one injured by explosion of Giant powder cartridges, at Star mine.

August.

26. Warrsn, Maine—Powder mill exploded; one man killed.

October.

9. Portland, Oregon—Man had part of arm blown off cutting a Giant powder cartridgs with a knife.

9. Council Bluffs, Ia.—Fearful explosion of a carload of Giant powder, causing great damage to railroad and other property. Loss reached about $500,000.

13. Bradford Pa.—Magazine of Rohert's Torpedo Co., containing 300 lbs. nitro-glycerine exploded; two men seen ahout before explosion; disappeared.

21. Moore's Flat, Cal., Wo Yen tunnnel—Blast of No. 2 Giant powder sst off in the evening, and no attempt was mads to enter the tunnel again until the following morning; of the men entering, 3 were taken out dead and 18 insensible from the effect of the fumes still remaining.

November.

8. Lake Superior—Explosion of 400 lbs powder at Quincy mine; mine hadly wrecked; thres men killed.

19. Great Sierra mine, Tioga District—One man fatally, and two seriously injured by thawing frozen dynamite powder; Excelsior powder.

22. Ventner, Idaho—Ons man killed thawing Giant powder.

24. Victoria, B. C.—Ons man killed and two seriously injured hy premature explosion of Giant powdsr.

22. New York City—Seventy-third street; fearful explosion in thawing dynamite; eight persons injured and heavy loss to property.

24. Greenwich, Conn.—Five men killed hy prematurs sxplosion of Giant powder, and three injured.

26. Lundy, Mono Co., Cal.—Two men injured at Nioma mine hy sxplosion of Giant powd r.

December.

3. Virginia City, Nev.—One man killed and one seriously injured hy explosion of Giant powder at Forman shaft, caused by drilling into an unexploded cartridgs.

5. Bradford, Pa.—Nitro-glycerins magazins, helonging to Roherts' Torpedo company, containing half a ton, found fuming from spontaneous comhustion and left to hlow up.

16. Washingtonville, N. J., railway station of New York, Susquehanna and Western railroad—Totally destroyed hy explosion of Giant powder.

19. Mount Union, Pa.—A whole family of six persons killed in thawiug dynamite.

31. Wampum, Pa.—Two men seriously and two fatally wounded hy thawing dynamite.

Mining Share Market.

There is nothing much doing in the "Share Market," as onr quotations show.

Thens ws from ths Comstock is interesting, as showing that ths workings in several of the mines are approaching important points. Following is the dispatch:

VIRGINIA (Nev.), Jan. 25. — Crosscntting from the south drift No. 2, on the 2700 level of Union, will he commenced about next Saturday.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	15	50	Jan 6	Feb 9	Mar 2	W Willis 309 Montgomery st
Alta S M Co	Nevada	22	50	Dec 16	Jan 20	Feb 9	W H Watson 302 Montgomery st
Best & Belcher M Co	Nevada	22	50	Jan 4	Feb 7	Feb 23	Wm Willis 309 Montgomery st
Bodie Con M Co	California	1	50	Dec 6	Jan 24	Feb 23	W H Lent 309 Montgomery st
Bechtel Con M Co	California	8	25	Dec 3	Jan 9	Jan 30	W H Lent 309 Montgomery st
Bullion M Co	Nevada	23	30	Jan 19	Feb 21	Mar 14	J M Bazell 328 Montgomery st
California M Co	California	2	20	Jan 18	Feb 25	Mar 22	C P Gordon 309 Montgomery st
Champion M Co	California	10	25	Jan 12	Feb 20	Mar 13	B Burtis 309 Montgomery st
Chollar M Co	Nevada	7	25	Jan 9	Feb 14	Mar 7	W E Dean 309 Montgomery st
Con Imperial M Co	Nevada	17	10	Jan 4	Feb 8	Mar 1	W E Dean 309 Montgomery st
Exchequer M Co	Nevada	18	25	Jan 12	Feb 15	Mar 6	C E Elliot 327 Pine st
Gould & Curry S M Co	Nevada	41	50	Jan 12	Feb 16	Mar 9	A K Burbrow 309 Montgomery st
Hale & Norcross M Co	Nevada	72	75	Dec 21	Jan 25	Feb 16	J F Lightner 309 Montgomery st
Julia Con M Co	Nevada	17	20	Jan 17	Feb 24	Mar 16	H A Charles 419 California st
Mariposa Land & M Co	California	22	25	Dec 23	Jan 31	Feb 28	L Leavitt 309 Montgomery st
Martin White M Co	Nevada	11	25	Jan 20	Mar 2	Mar 30	J J Scoville 309 Montgomery st
Mono G M Co	California	15	50	Dec 5	Jan 10	Jan 31	W H Lent 309 Montgomery st
Monumental T & M Co	Nevada	1	05	Dec 30	Jan 31	Feb 21	D B Chisholm 327 Pine st
Napoleon M Co	California	1	03	Jan 13	Feb 13	Mar 2	H Smith 309 Montgomery st
Navajo M Co	Nevada	15	15	Dec 3	Jan 17	Feb 8	J W Pew 310 Pine st
New York M Co	California	27	15	Jan 18	Feb 21	Mar 13	F E Dietz 327 Pine st
Noonday M Co	California	5	25	Dec 30	Feb 8	Mar 2	W J Taylor 310 Pine st
North Noonday M Co	California	5	25	Dec 30	Feb 10	Mar 6	W J Taylor 310 Pine st
North Standard G & S M Co	Cal	2	10	Nov 30	Feb 1	Feb 20	C V D Hubbard 310 Pine st
Original Keystone S M Co	Nevada	6	50	Dec 8	Jan 12	Feb 4	F E Luty 330 Pine st
Overman S M Co	Nevada	52	50	Jan 9	Feb 14	Mar 7	Geo D Edwards 414 California st
Rex Montis M Co	California	14	25	Jan 9	Feb 14	Mar 10	J W Ward 426 California st
Savage M Co	Nevada	49	50	Jan 6	Feb 8	Feb 23	E B Holmes 309 Montgomery st
Sierra Nevada S M Co	Nevada	71	1 00	Dec 29	Feb 1	Feb 20	E L Parker 309 Montgomery st
Spaulding G & S M Co	California	3	10	June 23	Feb 23	Mar 24	J W Pew 310 Pine st
Tioga Con M Co	California	15	10	Jan 12	Feb 16	Mar 8	W H Lent 309 Montgomery st
Tombstone Con G & S M Co	Arizona	1	02	Jan 9	Feb 13	Mar 6	J M Buffington 309 California st
Utah S M Co	Nevada	37	1 00	Jan 14	Feb 17	Mar 7	G C Pratt 309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	4	03	Dec 27	Jan 30	Feb 17	J M Buffington 309 California
Bay State S M Co	Nevada	1	02	Dec 29	Feb 6	Mar 6	J W Pew 310 Pine st
Blue Bell Con M Co	Nevada	2	50	Jan 19	Feb 24	Mar 17	H P Bush 431 California st
Bntte Creek Hydraulic M Co	California	8	10	Dec 29	Feb 15	Mar 6	A L Taylor 230 Montgomery st
Con Awador M Co	California	3	50	Dec 21	Jan 24	Feb 11	F B Latham 310 Pine st
Excelsior Deep Grav M Co	California	17	25	Jan 10	Feb 14	Mar 7	D B Chisholm 327 Pine st
Excelsior W & M Co	California	3	1 00	Jan 9	Feb 10	Mar 2	L C McAfee 328 Montgomery st
Gopher Con M Co	Nevada	2	50	Jan 11	Feb 20	Mar 20	H Deas 309 Montgomery st
Maybelle Con M Co	California	10	20	Dec 31	Feb 7	Mar 1	W J Taylor 310 Pine st
Mayflower Grav M Co	California	14	10	Dec 30	Feb 3	Feb 23	J Morizio 323 Montgomery st
McElroy Grav M Co	California	6	10	Dec 20	Jan 24	Feb 11	L Lillie 667 Washington st
Oro M Co	California	11	15	Jan 7	Feb 13	Mar 7	W Stuart 320 Sansome st
Pinal Copper Co	Arizona	2	2 00	Jan 5	Feb 20	Mar 20	Geo T Shaw 840 Fourth st
Peabody G M Co	California	3	04	Dec 31	Feb 4	Feb 25	E D Hopkins 436 Montgomery st
Rocky Point M Co	California	10	05	Jan 13	Feb 13	Mar 6	D M Ke t 330 Pine st
Santa Anita M & M Co	California	2	02	Dec 14	Jan 16	Feb 2	J B Tims 34 Kearny st
Sigourney G & S M Co	California	3	03	Jan 24	Feb 28	Mar 20	A Judson 320 Sansome st
South Hite G M Co	California	3	10	Jan 9	Feb 16	Mar 7	F A Berlin 420 Montgomery st
University G M Co	California	10	10	Dec 13	Jan 19	Feb 9	W L Oliver 328 Montgomery st
Vauderbilt M & M Co	Nevada	3	05	Jan 16	Feb 24	Mar 16	J Morizio 328 Montgomery st
Wide Awake Prospecting & M Co	Arizona	15	10	Dec 6	Jan 12	Jan 30	C Hil ebrandt Chronicle building

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alexander M Co	——	A B Coorer	328 Montgomery st	Annual	Jan 27
Con Amador M Co	California	F B Latham	310 Pine st	Annual	Feb 2
Hill side M & M Co	Nevada	F Frankenthal	330 Pine st	Annual	Feb 13
Holmes M Co	——	E A Holmes	318 Pine st	Annual	Feb7
Maryland Con M Co	——	E P Farnsworth	219 Sansome st	Annual	Feb 6
Standard Con M Co	California	W Willis	309 Montgomery st	Annual	Feb 6
Tuscarora M & M Co	Nevada	F Sperling	309 Montgomery st	Special	Jan 31
Wid awake P & M Co	Arizona	C Hilderbraudt	Chronicle building	Annual	Feb 8
Yuba G M Co	California	E Lande	309 Montgomery st	Annual	Jan 31

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	California	W Letts Oliver	328 Montgomery st	20	Dec 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Feb 13
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Jan 16
Silver King M Co	Arizona	J Nash	315 California st	25	Jan 16
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Jan 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	75 (extra)	Jan 12
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10	Jan 3
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10 (extra)	Jan 3
Western M Co	California	C S Curtiss	309 Mo atgomery st	75	Dec 22

MINING SUMMARY.

This following is mostly condensed from journals published in tbs interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

THE JOHN BULL CLAIM.—Ws are pleased to learn that a very rich strike has recently been made in the John Bull mins, about 3 miles southwest from Jackson, and that the present indications are that it will prove one of the richest mines in this locality when thoroughly developed. This mine was formerly known as the Anderson mine, it having been discovered by Mr. W. G. Anderson; but it is now owned by Messrs. Matson, Pleming & Carter.

MISCELLANEOUS.—Thare has been no ors found as yet in the east and north drifts at the Con. Amador. They have commenced a new drift from the 1000 level south. The Mahoney M. Co. paid off their employes on Tuesday of this week. The mine is looking better at present than ever before and promises to rank among the best paying mines in the State. Supt. Davies expects to commence crushing ore with the new mill at the Seaton mine this week. Knight & Co sent one of their large water-powor wheels to the Pacific mine at Plymouth this week.

NABOB.—Amador *Ledger*, Jan. 21: This quartz claim, situated above Hanley's ranch, near Pine Grove, and formerly owned by Vandament Bros., has lately been purchased by a San Francisco company. Work is being prosecuted on a small scale under the superintendency of Mr. White. The prospects for a paying mine are said to be good. The shaft is down over 30 ft, with a quartz ledge 3 ft in width. The ore is of good quality, judging from appearance. Free gold is often seen. Some 20 tons of rock are on the dump. Should the ore body continue as at present, the owners will probably put up a small mill during the coming spring.

BUTTE.

LAVA BEDS.—Oroville *Mercury*, Jan. 21: Mining in the vicinity of the Lava Beds is being carried on to a much greater extent this winter than for a number of years past. The ground has to be stripped to a depth of from 5 to 16 ft, and usually these holes are so full of water that the Chinamen are forced to leave them. This winter the case is different, for, there being but little rain, they are not molested, and are taking out a large amount of gold dust. About $10,000 worth is taken to the Mint from these mines every month.

CHINESE MINERS.—When the Miocene mine was closed by an injunction, the Oroville M. Co. also ebut down work on their claim, in which J. B. Hewitt and ex-Governor Low are the chief owners, no doubt fearing that they would be the next to be visited by an injunction. A few days since the entire mining claim was leased to 3 companies of Chinamen for a term of 6 years, for a large sum, and now the Chinamen are as thick as bees all over the claim, with pan, pick, shovel and rocker. They are to mine 30 feet deeper than the present bed of the mine, but are not to let any of the dirt find its way into Feather river or any of its tributaries. Tbis claim is rich, and there was much rivalry between the Chinese companies as to which should get it.

CALAVERAS.

HYDRAULIC MINES.—Calaveras *Chronicle*, Jan. 20: As soon as the water supply had increased sufficiently to enable work to be commenced in the hydraulic mines in this vicinity, the season was opened with active operations all along the line. The freezing weather for the past 10 days has been a serious drawback to hydraulic mining, tbe water supply being so reduced that all the mines were shut down, during which period the time was occupied in fitting up.

DURYEA HYDRAULIC.—At present the work of running off surface ground is being done as fast as the water supply will permit. It is the purpose to uncover a large extent of bottom gravel during the winter, and to run off the bedrock gravel later in the season. All that is necessary to prosecute the work vigorously is a good supply of water.

MAMMOTH HYDRAULIC.—John Vieth, Esq., of the Mammoth mine, has everything in excellent condition to complete a profitable season's run. The gravel in this claim is very much cemented, requiring blasting, which will be done at once

PENOBSCOT MINE.—Mr. George Emersou, of the Penobscot mine, is industriously engaged in removing large rocks preparatory to running water again. The past summer a bedrock tunnel was run, giving more grade, which improves the working facilities of the mine greatly. The indications for a good cleanup are certainly most flattering.

BONANZA HYDRAULIC.—We found Mr. Moser at the Bonanza with pan in hand engaged in making a cleanup, which, judging by his smiles and good humor, sustains the reputation of the famous "Bonanza." If the gravel mines of this section were located in any of the northern counties, more satisfactory results would be obtained. Our water supply being limited is one serious drawback, and the Chili gulch mines are so incumbered with tailings that the grade is too small to work on a northern county scale. All thie would easily be obviated with the proper expenditure of capital, and pay good dividends to the investora.

EUREKA AND PINE PEAK MINES.—The Cook Bros. are diligently prosecuting work at their Eureka and Pine Peak mines. The Eureka, managed by Mr. Aaron Cook, has a large supply of free water, supplied by their two ditches, the Eureka, 12 miles in length, conveying water from Esperanza creek and Calaveras river to the mine, and the Calaveras ditch, 6 miles in length, conveying water from Jesus Maria creek to the claim. With an ordinary water season, a large scope of country will be washed off, which will insuro the owners a much larger dividend than was realized last year. Work was suspended a few days on account of the freezing weather, but all is running again like clock-work. Mr. Wm. Cook is managing the Pine Peak claim, which he has fitted up in good shape with a water supply from the Mokelumne hill ditch. The gravel bank is a ridge 60 ft in depth, is free from cement, and prospects well. The Cooks, with their industry and experience, will make the Pine Peak one of the best hydraulic properties in the county.

LAMPHEAR MINE.—The work of pumping out the water in the Lamphear mine was commenced last Tuesday. The energetic, business-like manner in which operations have been pushed reflects great credit upon the efficient superintendent, Mr. H. F. Lambert.

INYO.

PANAMINT.—According to A. W. Robinson, who lately brought some $2,000 in silver from Surprise canyon into Darwin, there are about 60 miners at work in Panamint, extracting ore for Pinney's much abused and blackmailed "Eastern company." The big mill is steadily pounding out bullion, and we are glad that New Yorkers get the dividend benefits.

ISLE.—The Lookout country is idle, the late lessee of the Modock being in San Francisco. The Snow Canyon and Minnesota works, in the same district, and adjacent, are also quiescent. Lee district, just this side of Darwin, with its fine mill, is in the hands of San Francisco Micawbers, waiting for "something to turn up."

DARWIN.—Inyo *Independent*, Jan. 21: From Billy Lake, who visited Darwin a day or two ago, we learn that the present business and future outlook is much hetter than for years past. Messrs. Reddy & Gorman have some 25 or 30 men employed in the Defiance and Custer mines, both of which are looking better, if possible, than ever. Twenty tons of bard ore is being delivered at the furnace daily, there being now about 1,000 tons at the stacks, with 20,000 bushels of coal already delivered. Both the Defiance furnaces will be fired up on the 25th, requiring altogether about 60 men to keep them going. The late cold weather has delayed much necessary outside work, preparatory to the proposed long run; otherwise the bullion output would have begun before this.

KEYNOT.—Superintendents O. G. Fuentes and Peter

Taylor, of the Keynot mine and the Taylor and McEvoy mill, respectively, are now in Beveridge district taking a new look at things generally. They are accompanied this time by H. H. Scott, a prominent San Francisco stock broker. It would rather look as though the Keynot owners have already lost too much valuable time in truckling to possible San Francisco purchasers of their rich mine. At least two-thirds of the money they ask for it could have been taken out in the meanwhile.

LOS ANGELES.

SILVERADO MINES.—Santa Ana *Standard*, Jan. 20: Thos. Harvey and E. A. Edwards, of Los Angeles, both old prospectors, came in from a trip, last Tuesday, to the Silverado mines, situated about 18 miles east from this place. Mr Harvey reports that the snow now lies there to the depth of 18 inches. The late storm was the severest ever known. Very little is being done upon the mines at present, but arrangements are being perfected to push work upon the New York Company's mines, and on the Dunlapp mine at an early day. The mines there —more properly the Santa Rosa mining district—have a good reputation, and it is believed that the work to be prosecuted upon them this season will result in causing the district to attract considerable attention. The character of the ores in this district are both free-milling and smelting. There is plenty of water and considerable wood, and the Santa Clara coal mine, owned by the Southern Pacific Railroad Co., is distant only four miles. Whether this coal is of a quality to produce coke we have not learned. If it will, then furnaces could be run in that district more cheaply than in any other we know of.

MONO.

BODIE.—*Free Press*, Jan. 24: The principle feature of last week was the advance in Bodie and Mono stocks. Much speculation was indulged in as to the cause of the movement, the stock sharps in San Francisco generally considering its a speculative advance. The facts are that the advance was caused entirely by orders from Bodie for these stocks, and the subsequent decline occurred when these orders were filled. These orders were doubtless based on the cutting on the 18th of a rich vein, or seam as it is modestly termed in superintendent Whiting's report, in a west crosscut from winze No. 9, below the 6th incline level. The vein is about 6 inches wide, and very rich. It widens on drifting south. The recent discouraging reports in regard to Bodie are by no means justified by the facts. There is a 6 week's supply of ore at the mill, and many months—and doubtless years—supply in the mine. There is no change reported in the Standard, and work has not been resumed in the shaft. The flow of water in the Red Cloud shaft has decreased in volume, and it is thought work will be resumed in the bottom shortly. The Oro shaft is down 686 ft. The next level in this mine will be run at 720 ft, and as a back of 200 ft will have been gained, the prospects of such a concentration of ore as to make a veritable bonanza, are very good. The Goodshaw will commence to crosscut during the present week at a depth of 750 ft. The Bodie tunnel mill is nearly ready to commence crushing, and the Miner's mill has already commenced on Boston Con. rock. Prospecting on the 982 level of the Tioga continues, with encouraging results. No difficulty is experienced in keeping the Noonday mill supplied with ore, which may also be said of the Syndicate. To sum up the situation, it can safely be said that there is more reason to be encouraged as to the general appearance of the district than for many months past. Those who have sufficient faith to stay with their stocks will yet receive their reward.

NEVADA.

OCEAN STAR MINE.—*Transcript*, Jan. 21: Supt. Searing of the Ocean Star mine, 3½ miles above Washington, was in town yesterday. The property he is in charge of is owned by Chicago capitalists who are conducting it as a private business enterprise, no stock being for sale. They put down a shaft and extracted about 300 tons of very good looking ore. Upon reaching a depth of 50 ft the water came in so fast that they abandoned the idea of sinking further and concluded to run a tunnel which will be less expensive and more effective than working through a shaft. The tunnel will be pushed through as rapidly as possible to the ledge which will be reached within a distance of 180 ft. The company's new ten-stamp mill will be finished in 3 weeks and the stamps will then begin dropping. Supt. Searing says that the mine will pay if the ore yields $5 a ton, so large is the ledge.

RICH SPECIMEN ORE.—Nevada *Transcript*, Jan. 22: Some specimens of ore that will pay at the rate of $20,000 or more a ton were found night before last on the 350-ft level, north of the Nevada City mine. These exceedingly rich bunches are frequently encountered in that part of the mine where the ledge varies from 1 to 4 ft in thickness. The water is now all out of the workings and the incline is down 90 ft towards the 450 level which will be started this week.

THE DERBEC DEVELOPMENT.—A few days since we published as a rumor the statement that a rich strike had been made in the Derbec drift mine. Subsequently the rumor has been verified by a gentleman who came down from North Bloomfield on Friday. He says that a 12 ft deposit of gravel paying from 25 cents to $1 a car has been found in the east drift from the new shaft. In addition to this, No. 11 from the old shaft, which has been running through barren ground, came into good gravel a few days since.

SAN BERNARDINO.

THE PROVIDENCE MOUNTAIN MINES.—San Bernardino *Times*: Little has been said regarding the mining interest of the Providence mountain mines. J. B. Cook, who has had charge of the mines owned by Messrs. Osborne, Hasson, Boyer and Drew, arrived here a few days ago, and we glean a few facts as to the workings of Trojan mining district, Providence mountain, from him. It appears that there have been from 20 to 50 men working on what is known as the Bonanza King and Rattler mines for the past 6 months, and large developments made. The deposits are gaining strength with the developments made; there is now showing in the lower workings over 400 linear ft of large mineral deposits. So far they have not stoped any ground, and all the ore on the dump is taken out of shafts and drifts, of which over 1,000 ft have been run; besides, they have had a large quantity of ore shipped and worked, which has averaged over $700 per ton. They are now having teams loaded back with ore assaying over $750 per ton. This is done no doubt to get freighters more readily. These mines have been self-sustaining since the first day they were struck by Messrs. Hasson and Andrew McFarlane. There is now at the very closest estimate over $150,000 assay value on the dumps, and within all reason 10 times as much in sight in the mines. The mines are in limestone, with a porphyry contact to the east.

SAN DIEGO.

JULIAN.—San Diego *Union*, Jan. 10: Mr. J. S. Buck, of Julian, called on us last evening. He informs us that there is considerable excitement up there over a recent strike by the Wilcox boys in the St. Valentine mine. They are are said to have opened a ledge of $20-quartz two ft wide.

SHASTA.

ARASTRAS.—Shasta *Courier*, Jan. 21: There are a number of arastras and one mill operating in Deadwood district, on the line of Trinity and Shasta counties, and we are informed that additional machinery is to be put up in the spring. The mines are paying splendidly. A 60 ft tunnel run in on the west side of the Lost Confidence mine at Iron mountain, just 1 mile from where the main tunnel and shaft was started, reveals the same quartz and mineral found in the principal works.

QUARTZ.—There is a big excitement about quartz at the head of Hickey gulch, near Middletown. An old prospector and pioneer miner, by the name of Laurie, who has been absent from this county for years, but knew of the richness of the ledge, returned here some days ago and located claims on a quartz lode extending from the head of the gulch mentioned to Sugar Loaf mountain. The croppings from the lodge show an abundance of free gold, and will pay good wages to pound up in hand mortars.

SIERRA.

NUGGETS.—*Mountain Messenger*, Jan. 20: Three nuggets, weighing 18, 21 and 55 ounces, have, within the past few days been found in the Bald Mountain dump, Forest City.

THE Bald Mountain Co. are surveying the Extension tunnel this week. We hear that the Centennial Co., at Minnesota, have good prospecting gravel. The Bald Mt. Ex. Co. have rich gravel in their main tunnel being run eastward up the ridge.

FIR CAP.—At Fir Cap the Phœnix boys have the main tunnel of the old Shamrock claim repaired, and in about 1,500 ft from the mouth. But two men are working at present, but more are expected soon. Our friends at Monte Cristo did not escape the recent cold snap. Dumpiles and flumes are all frozen up, the thermometer having registered as low as 5 above zero.

BY THE DRIFTING PROCESS.—Sierra County *Tribune*: The New York Hydraulic Mining Co., at Morristown, this county, have commenced drifting in one of their claims, which is the first mining over done by that process in the camp. Storage dumps have been built, and everything is in readiness for operating on an extensive scale. Sixteen men are employed at present, but this force will be increased as soon as a sufficient quantity of water can be procured. A large portion of the company's ground can only be worked profitably by the hydraulic process. Consequently, 5 large monitors are stationed in their diggings, ready for operating on the banks of hidden treasure as soon as the water season commences. The company have expended a large amount of money in developing their valuable property. Under the management of E. C. Wheeler, acting superintendent, work is carried on in a practical and economical manner.

FLATTERING PROSPECTS. The Centennial Co., at Minnesota, last Friday night struck soft bed rock with an increased flow of water. The gravel which they are running in has improved very much in quality and appearance the last few days. The company will push ahead for the main channel, which they expect to reach in a short distance. And from the present favorable indications something rich will be opened out.

A FINE PROSPECT.—We are informed, just before going to press, that the Bald Mountain Extension Co. had struck very rich gravel in their main tunnel.

SCALES DIGGINGS.—Charles Hendel & Co., who have started a bedrock tunnel on the south side of Slate creek, between Scales and Port Wine, for the purpose of opening out drift claims under the ridge, have got their tunnel in several ft, being in good working rock. The boarding house and blacksmith shop are completed.

DOWNIEVILLE.—The Secretary's statement of the receipts and disbursements of the Bald Mountain Extension shows as follows for the month of December: Receipts, $8,705 05; expenditures, $2,993 37. This looks promising for our rich neighbors. A few more like this, and they will begin to receive the return for which they have labored so long, and waited so patiently.

A RICH STRIKE.—We were informed, a few days since, that while two poor but honest miners were wending their way up Kanaka creek week before last, discussing the prospects of making a "strike," or "panning out" a fortune in some new diggings, and when a few miles below Alleghany, they discovered a gold nugget lying in the creek. This streak of luck prompted a further search, and still another nugget was found among the sand. The result of their operations was that in two days they obtained as the result of their labors about $300 in nuggets, weighing from 1 to 10 ounces. It is supposed that the gold was lost years ago by some miner.

SEVENTY-SIX CO.—Messrs. McCormick and Pierson, who have a contract with the above company for running 500 ft of tunnel at the Seventy-Six drift claim, are nearly through with the job, having only 20 ft more to run. It is expected to strike bedrock in that distance.

WORK TO BE RESUMED.—Work on the Germania mine, at Alahama hill, will be resumed early next spring. The company have already run 1,200 ft of tunnel, and it is expected to find gravel by advancing the tunnel 400 ft further. The claim is adjoining the Cray Craft hydraulic mine, the latter being owned by Eggleston & Mowry. A. J. Blohm, an owner in the Bald Mountain Extension, is heavily interested in the Germania mine, and he expresses considerable confidence that they will succeed in opening up a paying property.

TRINITY.

PAYING WELL.—Trinity *Journal*, Jan. 21: Mr. Lambert, who is superintending operations at the Brown Bear mill and mine in Deadwood district, for Grayson & Co., was in town the early part of this week. From those who conversed with him we learn that it is the intention of the company to put 10 additional stamps in the mill, doubling its capacity, in the spring. Thus far the operations have proved very profitable, and Mr. Lambert expects to produce $200,000 during the current year. The quartz interests of Trinity have at last got a start, and we predict the discovery and development of more quartz mines, and a rapid increase in the gold production from this source.

AT WORK.—From Mr. F. T. Hawley, lessee and superintendent, we learn that the Willshire mine at Cox's bar is running with all the water it can use at present. Other mines in that section are also at work, and the prospects are spoken of as "good, as usual."

NEVADA.

WASHOE DISTRICT.

OPHIR.—Cold Hill *News*, Jan. 21: On the 2700 level the joint California east drift has been extended 80 ft, and the main east drift has been advanced 26 ft. In the joint Mexican east drift on this level are cutting out a drain and putting in boxes. The same work is also being done in the joint Mexican east drift on the 2900 level. During the week 160 tons of ore have been extracted from the croppings, and 173 tons and 220 lbs have been sent to the mills.

OVERMAN.—East crosscut has been extended 54 ft; face in birdseye porphyry. Have cut and put in 41 ft of covered drain and seven sets of timber.

SIERRA NEVADA.—On the 2500 level the winze in crosscut No. 2 has been sunk and timbered 10 ft and east crosscut No. 5 has been extended 27 ft.

CALIFORNIA.—On the 2500 level the C. & C. winze has been sunk and timbered 13 ft. On the 2700 level the joint Ophir and California east crosscut has been extended 30 ft.

UNION CONSOLIOATED.—On the 2700 level the main north drift has been extended 31 ft and the main south drift No. 2 on the same level has been advanced 41 ft.

MEXICAN.—On the 2700 level in the joint Ophir east drift are cutting out a drain and putting in boxes. Have resumed work in the main north drift. On the 2000 level in the joint Ophir east drift are cutting out a drain and putting in boxes.

CONSOLIDATED VIRGINIA.—Are still cleaning out and repairing drifts and winzes connecting with the old Consolidated Virginia shaft on the 1650 and 1750 levels for ventilation. On the 2500 level the C. & C. winze has been sunk and timbered 13 ft.

GOULD & CURRY AND BEST & BELCHER SHAFT.—The west crosscut, 2300 level, is in 583 ft; northwest drift, same level, has been extended 44 ft; total length, 304 ft. Drillhole from face of west crosscut is in a distance of 145 ft.

UTAH.—On the 2250 level are putting in a balance bob and pump column in the incline. On the 2500 level the east drift advanced 17 ft.

UNION SHAFT.—Are easing timbers at the 1600 station and repairing air pipe at the 2500 level; also, are repairing the drain tunnel on the 1600 level.

CONSOLIDATED IMPERIAL.—The east crosscut, 2800 level, has reached a point 150 ft east of the south winze.

ALPHA.—The joint Exchequer drift, 2800 level, is now in 240 ft north of Alpha south line.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, Jan. 21: The main shaft has been sunk 9 ft during the week; the total distance made to the 10th inst. was 17 ft. From this time forward much better progress in sinking will be made. The fourth shaft level has shown considerable improvement. In the winze, sunk 25 ft below this level, the ore was found in be pitching to the northwest, and it has been followed by drifting a distance of 21 ft on the incline, which will be the main winze. In the levels above the adit there is a large amount of work being done in the mine, both in prospecting and in opening old stopes, some of which are looking very well. The daily yield of ore from the mine has been about 54 tons. Bullion shipments for the week ending January 18th, $14,057 66. Shipments on January account to January 18 h, $33,-268.87.

MOUNT DIABLO.—The continuation of winze No. 1, on the third level, has reached a depth of 65 ft and is showing bunches of low grade ore. The winze from the west drift on the second level is down 94 ft, and has a well-defined ledge in the bottom which gives low assays. An opening has been started on the ore near the face of the east drift, on the same level, and now shows a 4-ft ledge which is somewhat mixed with waste. Assays from this point average $65 per ton.

PRINCESS.—The work of cutting out and retimbering the shaft still continues and much better headway is being made.

CENTRAL DISTRICT.

ORE.—*Silver State*, Jan 24: One of Alex. Wise's teams came up from Central yesterday, loaded with 13 tons of ore from the Keystone mine.

CRABB DISTRICT.

PROSPECTORS.—Esmeralda *Herald*, Jan. 21: A correspondent writes that prospectors are coming into the district every day. J. C. Lupton sunk a shaft on his claim adjoining the Glenn Bros. claim, and at a depth of only a few ft struck a 2 ft ledge of very rich ore. At a depth of 2 ft the Glenn claim struck a fine ledge. J. B. Hill has started a shaft on his mine. Other parties will commence operations at no distant day. There can be no question as to the richness of the district. Everywhere that work has been done good prospects have been found.

DOWNEYVILLE DISTRICT.

FURNACE.—Cor. Grantsville *Bonanza*, Jan. 21: The furnace started up on the 9th, and has been running steadily and doing good work ever since. One load of bullion (10 tons) was shipped last Thursday night, the 12th, and three more loads are ready to ship as soon as teams get here. The bullion is very rich, richer than was ever produced here before, averaging twice as high as Eureka bullion. And still the ore bodies continue as large and rich as when I wrote you last. It is not often that as huge bodies of such rich ore are found in any district. We are feeling more than hopeful now. We feel that Downeyville will soon become one of the foremost camps in the State, and our faith in it be justified by the present and future results. All honor to Mr. Raphael for his faith and courage in standing in with the Downey Co. and helping bring about the upraising of our camp. We cannot say too much in praise of the whole management, and I certainly but echo the sentiments of the whole community when I say that we hope it won't be many days now until they begin to reap a rich harvest of do lars and cents for the money expended and the faith and endurance shown by all.

ESMERALDA DISTRICT.

THE MINES.—Esmeralda *Herald*, Jan. 21: There is nothing unusual to report of our mines this week. The Centennial and Cortez are doing about the same amount of work as heretofore, both mines showing good ore in nearly every drift. The Cortez, especially, is developing most satisfactorily to the management, and we do not exaggerate in the least when we say that so far as opened it is second to no mine in Nevada. Bull on will talk soon, the company build their mill in the Spring. There is talk of several good properties being started up in a few days.

MACHINERY ARRIVING.—A load of machinery arrived Thursday for the Humboldt mill. We understand the rest of the machinery is expected in a few days.

GOLD PARK DISTRCT.

WORK.—Grantsville *Bonanza*, Jan. 21: Work is progressing steadily in the mines at Cold Park, Nye county, with the most flattering results. The ore bodies are all looking well and producing a fine grade of ore. It is expected that the mill will be ready to drop stamps about the first of February. Work has been delayed by the snow and cold weather. As soon as everything is in proper running order the Gold Park mill will give a good account of itself.

GRANTSVILLE DISTRICT.

CENTENNIAL.—*Bonanza*, Jan. 21: Under the management of T. K. Murphy this valuable property is being rapidly developed. In the south shaft a fine 6-ft vein of ore is exposed which is widening as work progresses. The north shaft is being put in shape for work and the extraction of ore of a good quality will be commenced in a few days. On the 14th inst. a mining man of large and varied experience visited this property. He was surprised at the indications he saw in the mine and felt confident that large bodies of fine ore would soon be cut into. On the 18th inst. a 6-ft vein of nice looking ore was cut into. He took samples of ore from the mine that he claims will assay from $200 to $400, and thinks that the owners of this property ought certainly to feel happy over their prospects. The ore encountered is of a different character to any yet found in the district, being of a much higher grade and carrying occasional streaks of antimonial silver and stephenite. In fact, developments are now being constantly made in this mine that will warrant the erection of hoisting and reductiou works, which will render it easy to carry on operations on a much more extensive scale and a profit to the company. In proximity to this mine, and on the same mineral belt, there are numerous other locations that will undoubtedly be worked as soon as it is clearly demonstrated that the Centennial can be made a self-sustaining and dividend-paying mine.

MOREY DISTRICT.

BULLION.—Belmont *Courier*, Jan. 20: Good ore was extracted from the Morey District Co.'s mines during the present week, and the mill is running nicely, producing fine bullion.

REVEILLE DISTRICT.

CHLORINE ORE.—Belmont *Courier*, Jan 20: They are still encountering rich chloride ore at Reveille, and the day is not far distant when bullion will again be produced and shipped from that district. Manager Clarke feels confident that the Reveille mines will produce large quantities of paying ore. He is now actively engaged in the work of developing the Continental Co.'s mines.

ARIZONA.

TOMBSTONE PATENT.—*Epitaph*, Jan. 20: We learn that the Tombstone M. & M. Co. have received a patent for the Ooodenough claim. Those who attended the late trial of that company against the Way Up will remember the strenuous efforts of the defense to defeat the title of the company to that mine. Similar efforts were made in Washington to prevent the issue of the patent, no less than 5 hearings being had before the Commissioner of Patents and one before the Secretary of the Interior. The points involved are of interest to every mine owner in Tombstone, for in this case, as in some other recent cases, the peculiar circumstances of outcrop in this district were used against the application, and the failure of these attempts is an assurance to other bona fide owners that this district is not without the pale of the law, as some interested parties would like to have the authorities believe.

COLORADO.

EMPRESS.—*Register-Call*, Jan. 20: Mr. J. W. Holman has let a contract to Eggleston, Strender & Co. for sinking the main shaft on the Empress mine 100 ft deeper, its present depth being 432 ft. The contractors also do the timbering. The vein matter has improved of late. The contractors receive $21 per ft.

GOLDEN AGE.—At the Golden Age the 250 levels are being driven, and are now out each way from the shaft a distance of 28 ft. The mill dirt is running an average of two ounces gold per cord in doing development work. The smelting iron gives a net return of $100 per ton. It is the intention of Mr. Holman to resume sinking the main shaft as soon as the lower levels are far enough away from the shaft to protect the miners engaged in sinking. The vein matter in the 250 levels is about 4 ft wide.

EAGLE.—Messrs. Sayr & Owen, on the Eagle, west of the Golden Age, are running the 225 level east to connect with the Golden Age at a depth of 250 ft. This will give better ventilation. They are also sinking the main shaft, now down about 300 ft.

GOLDEN FLEECE.—The owners of the Golden Fleece, north of the Eagle, are in good pay, two shafts being worked on the line of the vein. A good quality of smelting iron is being raised, the mill dirt averaging 5 ounces per cord.

UNEXPECTED.—Major Hal Sayr has developed a good crevice of pay matter, smelting and milling, in the Unexpected lode in the working shaft, at a depth of 170 ft. The mill dirt runs 6 ounces gold per cord, and the last smelting ore yielded $90 per ton net. The Unexpected gives a very promising showing. Mr. J. S. Bates is continuing the development of the Arctic by a system of levelage and in sinking. After having encountered caprock for a time, the crevice is coming in again. It is understood that parties will take hold of the Caledonia mine next month and develop that property. Wilson Swain has miners at work developing the White House lode recently sold to Denver parties.

IDAHO.

MEN AT WORK.—*Times*, Jan. 18: At the Red Elephant group 5 men are employed. They have just begun work on a tunnel which is intended to tap the vein at a depth of about 175 ft. It will be 150 ft long. On the Durango group 5 men are doing the assessment work on the several claims—of which there are 15 in the group. On the Bullion mine 15 men are engaged in the usual work, to-wit: sinking the shaft, drifting and opening up stopes. The O. K. is being worked, as usual, by 8 men. At the Eureka 5 men are working. Sixteen men are pushing developments on the Jay Gould. About 20 men are employed at the Mayflower, and more will be put on as stope are opened, and can be worked to advantage. But good men only need apply. At the Idahoan, 10 men are employed. Senator Kaiser is working 4 men. Bates & Boyd are working 3 men. Barney Quirg is working 5 men. Besides the above, about 30 men are working on their claims in a radius of 2 miles from the town. Altogether, about 125 men are working on mines in and around Bullion.

MONTANA.

NEW COAL DISCOVERY.—Benton *Record*, 20: The new coal discoveries on Little Willow creek are exciting much interest in Benton from the fact of their comparative nearness to town and the superior quality of coal they show. Although the coal has only been entered a few ft, the coal is better than any now mined in the vicinity of Benton. Pieces of it thrown into the fire make a genuine coke. It is black and bright, and resembles Cannel coal. The tunnel is now in 18 ft and the vein is about 30 inches wide. It is expected that 40 ft more will bring the tunnel to the true vein. Messrs. Mills, Stedman and Buckland have located the mine and are starting in briskly to work the same.

BLACKFOOT.—Helena *Independent*, Jan. 20: From Mr. John R. Quigley we learn that placer mining in the vicinity of Blackfoot is receiving a fresh impetus. Three Mile gulch, so-called because it is three miles from Blackfoot, has been opened up by a 22-inch flume at the lower end, and good prospects of coarse gold have been found, which promise handsome returns in the spring. As the gulch is six miles long, with a width of from 300 to 500 ft, it will furnish many years of prospecting mining before it is exhausted. Illinois gulch, near Blackfoot, has also been opened by a 20-inch flume 1,000 ft in length. The upper portion of this gulch was worked years ago and proved to be exceedingly rich. The lower portion, now opened, is believed to be fully as good and will be more lasting. Eureka, Snow Shoe and other gulches in that vicinity are also attracting the attention of miners and will be worked extensively next season. Altogether the outlook for Blackfoot is exceedingly promising, and it is safe to predict the return, in a large measure, of the good old times when its immense yield of placer gold made it one of the liveliest and most notable mining camps in Montana.

WICKES WORKS.—The new works at Wickes are gradually getting down to business. The smelter has been in operation now about 30 days, in which time it has turned out 200,000 lbs. of bullion. The new 15-stamp mill was started last Monday and is running smoothly and regularly on good paying ore. The town of Wickes is at present peaceful, the disturbing element—whisky—having been ruled out of camp. There is not a saloon in the place, and but one (a pitiful affair) about half a mile from town on the road toward the Oregory mine. There are between 35 and 40 families now residing in the village and the town is slowly growing.

NEW MEXICO.

CLIFTON.—*New Southwest*, Jan. 14: The Lesinsky mines of Clifton have turned out 2,734,604 pounds of copper within the past 12 months. The first silver brick of bullion from the Silver King at Florence in 1881, was $1,-809,000. The shipment from the Globe district for same period was $736,000. The superintendent of the Santa Rita company thinks that the one large smelter now in process of erection at the works will be entirely insufficient to reduce the ore to be taken out of the mines.

PROSPECTS.—Of late there has been a great deal of mining excitement in El Paso on account of the "signs" and "shows" of gold, silver, galena, copper, and coal, in the Organ range and sierras of the Hueco, Guadalupes and El Paso, on the American side, and the San Elas, Candelarias, Borachos and the Amargosa in Mexico.

BLUE BIRD.—In a shaft 15 ft deep which John Lambert has recently sunk on the Blue Bird mine, in the same district; a vein 2 ft wide shows up at the bottom. From this there has been taken considerable free gold, a specimen of which was brought into our office this week. The average value of the ore both of gold and silver is at least $600. From this one shaft 5 tons of at least this value has been taken and it bids fair to increase in quantity as they sink further down.

OCEAN WAVE.—George Doyle, the owner of the Ocean Wave mine, Mogollon camp, was in our office last Monday and showed us some specimens of quartz from his mine showing free gold in extraordinary quantities. The vein at 9 ft deep is 2 ft wide, and the ore assays all the way from $450 to $665 per ton. Recent work on the Orphan Boy develops the fact that it carries more surface copper than any mine in the Mogollons. The assay of silver intermingled, amounts to between 50 and 60 ounces to the ton. This mine is owned by Geo. Doyle also. We have also seen some very rich specimens from the Madakoff and the Bismarck mines of Hug Andreas and Mike Grace.

UTAH.

SILVER REEF.—*Miner*, Jan. 16: The bullion shipments per Wells, Fargo & Co. for the week ending to-day amount to $20,141.05. Two or three pay-days during the next week ought to liven things up considerably. Somewhere about $70,000 will be scattered among the boys. Six bars of refined bullion were piled in the stage office for shipment on Wednesday. That says more for the sandstone belt than a column editorial. The bullion shipments since the new year commenced have been unusually heavy, and were it not for the fact that 2 of our mills will have to shut down temporarily for needed repairs, the bullion shipments for January would be ahead of any month during the previous year. The Copper Mountain M. Co. have filed an adverse claim against the issuing of a patent to Ellerbeck & Co., for the Red Cloud copper mine at Copper Mountain. The Messrs. Adams & Sons are removing their smelting plant from the Grand Ouich copper mines to the Rio Virgin, at St George. This will be a decided advantage to the Southern Capital,

Reagents for Blowpipe Assays.

Directions for Preparing them and Testing their Purity.

The substances employed to produce chemical chenges in hodiee for their recognition are termed reagents. The quantities needed are so small that it is usually advisahle to purchase most of them; but as it is often difficult to procure reagents of proper quality, or any quality at all in isolated mining regions, we give herewith some simple directions for preparing some of them and for testing their purity, as prepared hy the Professor of Mineralogy in the Sheffield Scientific School—Prof. Brush. All the reagents of a well-appointed laboratory may be of occesional service in the qualitative analysis of minerals; but reagents other than these given will he hut rarely needed hy the student in hlowpipe analysis:

Carhonate of Soda; or Soda, in hlowpipe language.—Either neutral carhonate or bicarbonate may he used. To prepare it, take 4 or 5 ozs. of commercial hicarhonate of soda, free from mechanical impurities, place it in a porcelain mortar, add a little distilled water, and pulverize finely. Bring it upon a large filter in a glass funnel, and allow the water to drain off. Successive additions of water, in quantities of ahout 1 oz., are made, until a few drops of the drainings, caught in a olean test-tuhe, and acidified with nitric acid, give no precipitate, nor even the faintest turhidity with a drop of clear solution of chloride of harium. The washing often requires several days, and is sometimes not complete hefore half of the salt has been washed away. It is thus freed from sulphuric acid, which contaminates the commercial salt. Soda that is purchased as pure should he tested for sulphur and eulphuric acid, hefore trusting its purity. The salt as thus prepared is epread out upon paper and allowed to dry. Part of it mey he hottled while moist, and used in that etate; hut a part must be dried at a high heat, in order to expel all water. It is then pulverized aud put away for use.

Biborate of Soda.—Borax. The commercial salt is usually pure enough. Clean crystals are selected, and coarsely pulverized. For some tests, fused horax is required. To ohtain this, some of the commerciel selt is melted in a platinum dish, and when cool placed in a tightly stoppered hottle.

Phosphate of Soda and Ammonia.—Salt of phosphorus. Microcosmic salt. The very small quantity of this suhstance (1 oz.) needed for a great number of trials is best purchased. It may be prepared by dissolving in two parts of hoiling water six parts of crystallized phosphate of soda, end one part (ell the parts hy weight) of white and clean sal-ammoniac, and immediately filtering while still hoiling hot. The crystals that separate on cooling are freed from the chloride of sodium that adheres to them hy recrystallization. *Testing*:—It must fuse on platinum wire to a colorless, perfectly transparent globule; and when oxide of copper is added, and it is again heated, it must not tinge the flame with a hlne or green color.

Nitrate of Cohalt.—Cohalt eolution. The crystals of nitrate are dissolved in 10 parts of water, and filtered if neceesary. For uee, the cohalt eolution is moet conveniently kept in hulhs. The hulh is eaeily made from a hit of glass tuhe. In order to fill euch a hulh it ie gently heated, and the tip placed heneath the eurface of a solution of nitrate of cohalt in a ehallow dish. When a drop of the solution has entered, it ie again heated, the drop is converted into eteam, the tip is again immereed, and the eolution will almost instantly rueh into the hulh. It should not he more than two-thirde filled. To apply the eolution, the hulh is grasped gently in the palm of the hand, and inverted, when the expansion of the air ehortly forces out a drop or more, as ie required.

Nitrate of Potash.—Clean crystals of the commercial salt are powdered.

Bieulphate of Potash.—Eqnal weighte of clean nitrate of potash and oil of vitriol are heated together in a porcelain dish, gently at firet, afterwarde more strongly, till the nitric acid and excese of eulphuric acid are driven off and a clear liquid remains, which eolidifiee to an opaque mase on cooling. The salt thus ohtained ie pulverized, and preserved in a glase-stoppered hottle. It can also he prepared hy heating pure eulphate of potaeh with an excess of eulphuric acid, until the excees ie driven away and the mass solidifies on cooling.

Cyanide of Potaseium.—In nearly every case thie reagent can he dispeneed with, hy one who has perfeot command of the hlowpipe, ite only uso heing to facilitate difficult reductions. It can be procured of any photographer or druggiet.

Iodide of Potassium.—The clean crystals purchased of any druggiet.

Sulphur.—Flowere of eulphur.

Tin.—Stripe of pure tin-foil a half an inch wide and one inch long.

Zinc.—Stripe of common sheet zinc.

Lead.—Pure lead, for detecting gold and eilver hy cupellation, ie prepared hy dissolving acetate of lead (sugar of lead) in hot water, filtering, and inserting strips of clean zinc into the eolution. After 5 to 6 houre the precipitated lead should he ecraped from the zinc in order to expose a fresh eurface. When the lead ie all separated, it is washed thoroughly with water, then dried hy pressing hetween folds of hlotting paper, and finally by exposure to a gentle wsrmth.

Iron.—Clean wire of the thickness of a medium-sized sewing-needle. Iron in a fine state of suhdivision is nsed for reductions in the wet way.

Magnesium.—Bits of foil or wire are uscful in detecting phosphoric acid.

Silver.—A smooth silver coin, which must he freshly cleaned at the time of nsing.

Bone-Ash.—A little cup of hone ashes, called a *cupel*, ie used for the detection of silver and gold. Bones hurned to whiteness are finely pulverizsd and reserved for these purposes.

Oxide of Copper.—A copper cent is dissolved in nitric acid, the solution is evaporated to dryness, and the dry mass gradually heated to redness in a porcelain dish.

Fluoride of Calcium.—Pure *fluor-spar* is crushed and heated in a test-tuhe until decrepitation ceases; it is then finely pulverized.

Oxalate of Nickel.—The pure salt ie hest purchased, and when fused with borax hefore the hlowpipe, must give a brown and not a hlue glass.

Test Papers.—Blue litmus papers: Digest one part of the litmus of commerce with six parts of water, and filter the solution; divide the intensely hlue filtrate into two equal parts; saturate the free alkali in the one part hy repeatedly stirring with a glass rod dipped in very dilute sulphuric acid, until the color of the fluid just appeare red; add now the other part of the blue filtrate, pour the whole fluid into a dish, and draw strips of fine unsized paper through it; suspend these strips over threads, and leave them to dry. When dry, the papsr should have a fine hlue color, and mey he cut in narrow strips and kept in a tight hox. The moistened paper should he promptly reddened by the smallest trace of acids, and is used for their detection. When the litmus paper is reddened by a very feehle acid, it may he used for the detection of alkalies.

Turmeric Paper.—Digest ore psrt of hruised turmeric root with six parts of weak epirits of wine, filter the tincture ohtained, and steep slips of fine papsr in the filtrate. The dried slips must exhihit a fine yellow tint. It is turned hrown hy alkalies, and ssrves also in the recognition of horic acid, molyhdic acid, and zirconia.

Brazil-wood Paper.—Brszil-wood is hoiled with water, the liquid filtered, and paper saturated with it and dried. It is used for detecting fluorine, which gives it a yellow color; it also serves to recognize alkalies, which color it violet.

Wet Reagents.

Water.—Whenever water is used in analytical operations it should bs either distilled water, or clean rain-water.

Hydrochloric Acid.—Muriatic acid. The etrong commercial acid will answer for most purposes, hut it ie also advisahle to have some of the pure fuming acid, which on evaporation leaves no residne and when diluted with water gives no milkiness on the addition of chloride of harium.

Sulphuric acid concentrated, (ordinary oil of vitriol).

Nitric Acid, pnre.—It must leave no residue upon evaporation, nor give any turbidity with nitrate of eilver.

Phoephoric Acid.—The officinal concentrated eolution.

Ammonia.—It must he colorless, ehould leave no reeidue when evaporated on a watch glase, nor should it cause the sligutest turhidity in lime-water.

Carhonate of Ammonia.—One part of the commercial ealt is dissolved in fonr parts of water, to which one part of solntion of cauetic ammonia hae heen added.

Chloride of Ammoninm.—Select euhlimed white sal-ammoniac of commerce. If it contaiue iron or othor impurities it ie diesolved in hot water, and eet aside to recryetallize. The dried crystale are diesolved for uee in eight parte of water.

Phospbate of Soda.—Purify the salt of commerce hy recryetallization, and diesolve one part of the pure salt in 10 parte of water.

Oxalate of Ammonia.—Diesolve commercial oxalic acid, which has heen pnrified hy recryetallization, in two parts of hot water; add caustic ammonia, or carhonate of ammonia, until the fluid hegins to manifeet a slight alkaline reaction; filter, and eet aside to cool. The cryetale that eeparate are allowed to drain, and the mother liqnore are further evaporated to cryetallization. Purify hy recrystallization. Dissolve one part of the pure ealt in 24 parte of water.

Potassa.—Diseolve eome eticke of cauetic potassa in water, allow to etand, and eeparate the clear solution from the eediment hy decantation.

Chloride of Barium.—Thie salt may he purchased of any druggiet. For use, it ie dissolved in 10 parte of water.

Nitrate of Silver.—May he procured in cryetale from any druggiet or photographer.

Bichloride of Platinum.—Treat platinum filings (purified hy hoiling with nitric acid) with concentrated hydrochloric acid and some nitric acid, and apply a very gentle heat, adding occasionally fresh portione of nitric acid, until the platinum is completely diseolved. Evaporate the eolution to drynese on a water hath, with addition of hydrochloric acid, and dissolve the reeidue in ten parts of water for use. It is used for detecting potassa in the presence of eoda and lithia.

Molybdate of Ammonia.—Pulverize the snlphide of molyhdenum as finely as poseihle, and roaet it in a ehallow eheet-iron or earthen dish, at a low red heat, nntil it tnrns yellow, and becomee converted into molyhdic acid. It ie then digested with ammonia, which extracts the molyhdic acid; the solution is filtered, evaporated to dryness, and the molyhdate of ammonia which is left ie dissolved in water acidulated with nitric acid and kept for nse.

Removing Debris from Tunnels.

An entirely novel suggestion for the rapid removal of debris from the workings of narrow tunnels, driftways, or adits, hae heen made hy Mr. Emil Schrahetz, C. E., of Vienna, the removal heing effected without interfering with the work of the excavators, hy providing boxes or receptacles which are conveyed to and from the head of the workings along one or more overhead railways, eo that instead of, as at present, causing the debris to be changed into receptaclee which the men themselves have then to convey to the rear, thus interfering more or less with the work of the excavators, the men charging the receptaclee do not leave their position in front of the workings, the receptacles when filled heing raised to the overhead railway along which they are conveyed to the rear hy any convenient means. For these purposes, according to one arrangement, en overhead rail is snspended hy hrackets from transverse heams carried hy uprights at the side of the tunnel or driftway. The rail may he in long continuons lengths, or for facility of rapid erection and removal, it is mede of short lengths having tapered ends that overlap each other and are secured to the hrackets hy keye or holts. The hrackets are adjustihle in height on the beame, so as to adjust the level of the rail, either hy means of wedges, or by forming the pendant part separate from the part secured to the heam, and providing hoth parts with toothed or notched faces that take into each other, and are secured by a ring embracing both when adjusted to the deeired hight. The rail may he provided with shunts and switches, when there is only one line of rails, for trucks running in hoth directions to pass each other, or there may he two or more lines of rails. The trucks consist of metal frames with wheels running on the rails, and with pitch wheels or barrels, over which pass chains or cords for raising and lowering the boxes charged with the debris. The axes of these pitch wheels or harrels have ratchet wheels rotated hy levers cerrying pawls, the levere heing hy preference of short length, and provided with eockets or pins to which may he temporarily connected long levers for working them from the floor of the tunnel.

Variations in detail are, of course, permissihle, so that it will readily he understood that the hoxes may he raised hy simply hauling at the chaine or ropes without gearing, or the hoxes may be lifted by hand, and either he suspended from hooks on the carriages, or they may have loops at their uppsr ends, with one or more rollers, hy which they are hung directly on to the rails without separate carriages; or again where compressed air or water pressnre is available, the raising may he effectsd hy means of a small motor engine worksd hy air or water pressure. The hoxes may either consist of simple rectangular receptacles, by preference suspended hy chains attached to trunnione eitnated at or near their center of gravity, so that they can he readily tipped over eo as to deliver their contents into the wagone for the dehrie at the rear of the workings, or they may he conetructed of two halvee hinged together at their upper edgee and held together hy a suitahle holt or catch at hottom. To tbe two halves are eecured the ends of a toggle, to the middle joint of which ie attached the euspending chain, eo that on releasing the eaid holt or catch, the pull on the toggle hy the chain will canse the two halves to open at the hottom and deliver their contente into the wagon. Or in place of emptying the hoxes into the wagon they may he lowered with their contente into the latter, to he discharged outside the tunnel.

According to another arrangement, there ie provided in place of, or in combination with, the fixed overhead railway a portahle length of overhead railway, coneieting of a framing or carriage running on wheele on the floore of the tunnel, on the top of which are one or more heams with raile projecting at the front end eufficiently heyond the carriage to extend to the tunnel head, eo that the trucks with the hoxee can rnn thereon right up to the place where they are to he charged, while at the rear end the heame either hnt against the end of a fixed overhead railway, eo that the trucke can rnn from the one on to the other, or the beame are made to overhang eufficiently for the wagone to he hrought underneath them for receiving the dehrie from the hoxee. These portahle railways, when hrought into position, are eecured hy strutts against the roof and eides of the tunnel, the sti atte consisting by preference of ecrew spindlee ecrewing into cylindrical sockete, whioh are turned hy meane of spanners. The carriage with the portahle railway may extend either the whole or part of the width of the tunnel, and they may have either a douhle or eingle line of railways, or the trucks carrying the hoxee may he made the full width of the framing rnnning on two raile, in which caee, for the eonvenience of working, the levers for raising the hoxes, the shafts, with the pitch-wheel and gearing, may he arranged in diagonal positione.

Senator Miller hae preeented to the Senate the memorial of the California Academy of Sciences, urging a continuance of the coaet and geodetic snrvey in Alaska.

Miners' Superstitions.

Whistling Underground.

A singular eupsrstition prevails among foreign-horn minere in the great Pennsylvania coal fields, that if anyhody whistles in a mine some disaster is sure to follow. Miners born in this country do not share this superstitions helief to any great extent, hut in deferenoe to the wishss of fellow lahorers, they never whistle in the minee. Sometimes they sing and hum their plaintive hallads hundreds of feet helow the surface of the earth, and as a rule, miners are cheerful and contented. The superstitious helieve that a "good luck spirit" lurks in every mine, and that at the sound of whistling it flies, and leaves the minere at the mercy of numberless "spirits of evil." A terrihle mine disaster occurred in 1840, which was caussd, it is claimed, hy the whistling of one of the miners. The mine was the propsrty of tbe Delaware & Hudson Canal Co., and was not properly supported with strong timbsrs. This fact was known to most of the miners, and the shaft, a mile in length, was to have heen ahandoned in a few days. The miners were ahout to quit work, when a reckless parson named "Jack Richards" suddenly laid down his pick, and startled his companions by saying he would whistle a jig eo they could dance a farewell to the mine. The miners in vain proteeted, hut Richards laughed at their superstitious idees, and oommenced whistling. The miners were preparing to leave the plece at once, and the more frightened they hecame, the louder and faster Jack whistled. In the midst of the tune, a dull, roaring noise was heard, and every cheek hlanched with terror, for they knew the mine was caving in. "Jack" advised tbem all to run for their lives, and be led the way. Another crash ceme, masses of falling rock thundered down, and they were imprisoned—these 17 men, in a space only 40 feet square.

Imprisoned in a Mine.

The gust of wind that had rushed through the shaft when the caving-in occurred, had extinguished every lamp, and, for a wonder, there was not a match in the party. They oursed Richards heartily, hut he did not respond. Subsequently he was found dead, crushed hy the fallen coal and rocks. He was the only one of the party who was injured in any way. The imprisoned men worked as men never worked hefore, and as they were ahout giving np all hope of ever seeing their friends again, a noise was heard against the rocks and they oould hear the regular click of the picks of the men who were working to rescue them. Preeently a ray of light was seen, and in a half hour more the men were saved. The hody of Richarde was extricetsd and taken to his home for hurial. Very few of the miners attended the funeral, helieving that tho disaster was due entirely to Richarde having driven the "good epirit" out of the mine with his lively whistling. Richards had no relatives in the world hut a sickly sister, and she was so prostrated hy the loss of her hrother that she died the next day, and the two were huried at the same time. A mine hoss, named Hosie, was also imprisoned in the mine and given np for dead. Three days after the terrihle accident he made his appeerance, haggard and pale. He had dug his way for an incredihle distance through the dehrie, without food or water to enetain him. Thie mine tregedy is a favorite topic among the old miners, who never fail to warn visitors who descend into the ehaft that they must not whietle or talk loud enough to frighten away the "good epirits."

The Burning Mine.

Near thie place, and within a few steps of the famous Switchhack railroad, ie the great hurning mine, which hae heen on fire eince 1858. The origin of the fire is acoonnted for hy the euperstitioue from the faot that a ekeptical miner was whistling in the shaft, and hardly had he ceased when the announcement oame that the mine was on fire. Thie mine hae been flooded, but the fire cannot he extinguished, and every year it keeps on gnawing its way through the vast veine of coal, deetroying millione of tone of anthracite.

On the 2d of Decemher, 1872, Morgan Powell, a mine hoee, imagined he heard a man whistling in the shaft. Inveetigation proved that no one had heen whietling at all. He was told hy the minere that he had had a had omen, and that eome trouhle would hefall him. That night, as he wae leaving the etore of Capt. Williameon, at Summit Hill, midway between Laneford and Mauch Chunk, he wae ehot dead by Mollie Maguire aeeaeeine, who were afterwards captured hy Detective McParlan and hanged at Manch Chunk. The minere think it wae the whietle of the fatal hullet he heard that morning.—*Philadelphia Times.*

Turner has introduced in the House a joint reeolntion providing that Congrese ehall have no power to paee any act or reeolution for the appropriation of any money or creation of any debt exceeding $10,000 at any one time, unlese the eame, on its final passage, ehall be voted for hy a majority of all memhera then elected to each hranch, and the ayes and noee entered on the journal.

A "Solar" Locomotive.—According to *Nature*, "a 'eolar" locomotive has heen placed in the French Northern railway. It ie eo called owing to an electric light which is placed in front and fed hy the engine iteelf, and intended to illuminate the way for a long dietanoe in front."

Debris.

In the course of an examination in the Gold Run case, Mr. L. L Robinson, President of the Miners' Association, described the canals and reservoirs comprising the water system of the North Bloomfield, Milton, and other mines, claiming that the storage of water in winter and the discharging of the same into the streams during the dry season had a beneficial effect upon the navigable streams of California. He enumerated the causes which induce natural wash, claiming that this natural wash is very large, and annually increasing. The denuding of the mountainous districts of timber, and frequent and extensive forest fires, add very largely to the natural wash. When I first became acquainted with the country along the Yuba in 1856, there were extensive forests of fine timber. Now it is all, or nearly all, cut off. Some of the reservoirs on that divide are situated at an elevation of 7,000 ft., and very many of them more than 6,000 ft. When the present owners of the North Bloomfield and Milton mines purchased their property, the surface had nearly all been washed off—in some places to a depth of more than 100 ft. This was of a looser and much lighter material than that at present being worked in those mines. The amount of displacement by hydraulic mining annually is about 40,000,000 cubic yards. I have examined into this matter very closely. One of the tunnels at the North Bloomfield mines is over 10,000 ft. in length; was two years in construction, and cost many thousand dollars. The ravines into which those mines dump are filled to a great depth by the coarse debris. The river is also widened and filled to a great depth with this material, and it remains there to-day intact, and I have every reason to believe it will remain there forever. The number of mining inches taxes paid on by hydraulic miners, under the Debris Act, was 9,500,000. The giants and monitors do not increase the amount of material wash, but save labor. They are a labor-saving machine. Frequently, in the early days, during the time I was engaged in constructing the Sacramento Valley railroad, I had occasion to visit San Francisco, and I recollect very well of the difficulty of the river navigation at that time at the Hog's Back and other shoals. The natural wash of Quercus creek, a small stream about seven miles in length, which is dry nine months in the year, has changed its channel in different places quite often, and during the past four years has deposited on my land 2,600,000 cubic yards of material. Mr. Robinson named the great number of creeks, ravines and gulches which pour into San Pablo bay from the agricultural districts and steep slopes contiguous to the bay, and stated that the natural wash contributed by those myriads of streams was simply immense. Mr. Robinson traced the debris flow from the Cherokee mine, through Sawmill ravine, the valley of Deer creek, and thence to the head of Butte slough. The tailings are all impounded, and the slickens caused to be deposited on the soil to such an extent that the water when it reaches the slough is just as clear as it was when it first entered through the pipes in the Cherokee mines. In this case the miner is enriched, the farmer is enriched and the water enters the river in all its original purity. The hydraulic mines in which I am engaged could not be worked with profit in any other way except by the hydraulic process. They would not pay expenses by the drifting process, but by the hydraulic process they would pay very largely.

I have invested more than half a million in the Bloomfield mines. Our largest investments consisted in constructing canals and reservoirs. The dividends from those mines have been over $800,000, and if we had not been enjoined this year, we should have declared an additional dividend of more than $500,000. The gross amount of gold that has been taken from those two mines amounts to $3,835,000. The Cherokee mines are about 12 miles from Oroville and about 30 miles from Butte slough. These mines are worked by the hydraulic process. Their deepest tunnels are not yet completed. They are working in the upper gravel, and have not as yet mined deep enough to get the heavy blue gravel. These mines are owned and worked by the Spring Valley Gold and Hydraulic mining Company.

Bears and Wolves and Telegraphs.—The director of the Norwegian telegraph says: That bears are often attracted by the humming of the wires, which sound, they evidently suppose, comes from a swarm of bees. On reaching the posts and finding no hives or honey in sight, they appear to conclude that it is hidden under the heap of stones which is generally piled up around the foot of the poles, and accordingly scatter them in all directions. When the first telegraphic lines were established in Norway, an attache of the government stated that, although his district had no direct interest in the proposed line, he would vote for the appropriation, because, in his opinion, the wires would drive all the wolves from the region, for it had been noticed that wolves, however hungry, would never pass under a wire or rope; they would not enter a yard which was protected simply by cords stretched from post to post around it. Be that as it may, it is said that for this or some other reason, no wolves have been seen in that region for 20 years, during which time telegraph wires have been stretched across the country.

Useful Information.

Polishing Wood.

Turned articles must be brought to a fine, smooth surface with the finest sand-paper, and the direction of the motion should be occasionally reversed, so that the fibers that are laid down by being rubbed one way may be raised up and cut off. To apply the polish, which is merely a solution of shellac in alcohol, take three or four thicknesses of linen rag, and place a few drops of polish in the center; lay over this a single thickness of linen rag and a drop or two of raw linseed oil over the polish. The rubber is then applied with light friction over the entire surface of the work, while revolving in the lathe, never allowing the hand or mandrel to remain still for an instant, so as to spread the varnish as evenly as possible, especially at the commencement, and paying particular attention to the internal angles, so as to prevent either deficiency or excess of varnish at those parts. The oil in some degree retards the evaporation of the spirit from the varnish, and allows time for the process; it also presents a smooth surface and lessens the friction against the tender gum. When the varnish appears dry, a second, third, and even further quantities are applied in the same manner, working, of course, more particularly upon those parts at all slighted in the earlier steps.

Flat surfaces are polished in a similar manner. The wood must be filled, as it is called, and for this nothing is better than whiting, colored so as to resemble the wood and kept dry. Rub the latter with linseed oil, and then sprinkle it with whiting. Rub the latter well in, wipe it off carefully and give time to dry. This is far superior to size.

The polisher, however, generally consists of a wad of list, rolled spirally, tied with twine and covered with a few thicknesses of linen rag. Apply a little varnish to the middle of the rubber, and then inclose the latter in a soft linen rag, folded twice. Moisten the face of the linen with a little raw linseed oil, applied to the middle of it by means of the finger. Pass the rubber quickly and lightly over the surface of the work in small circular strokes, until the varnish becomes nearly dry; charge the rubber with varnish again, and repeat the rubbing till three coats are laid on, when a little oil may be applied to the rubber and two more coats given it. Proceed in this way until the varnish has acquired some thickness; then wet the inside of the linen cloth, before applying the varnish, with alcohol and rub quickly, lightly and uniformly the whole surface. Lastly, wet the linen cloth with a little oil and alcohol, without varnish, and rub as before until dry. Each coat is to be rubbed until the rag appears dry, and too much varnish must not be put on the rag at one time. Be also very particular to have the rags clean, as the polish depends in a great degree upon keeping everything free from dust and dirt.—*Exchange.*

Production of Magnesia.—The cheap production of Magnesia on a large scale has become a subject of much technical importance since this material has been found to be quite important in the manufacture of cements, artificial stones, fire-proof bricks, and other refractory materials. The immense quantities of chloride of magnesia found in the celebrated salt deposits at Staesfurt, in Prussia, have caused many efforts to be made to produce magnesia from this source. The latest proposal of this kind is that of M. Closson, of Paris, who treats the chloride of magnesium lyes with burnt dolomite, and has apparently succeeded in producing a very pure magnesia. Magnesia bricks made from material produced by this process, have, according to the *Chemical News*, withstood even the heat of the oxy-hydrogen flame. The process of M. Closson, according to published accounts, has been introduced on a working scale at Leopoldshall.

Blue Sugar.—Granulated sugar is frequently found to have a peculiar blue tinge, the cause of which has been a mystery to many, and we frequently receive inquires respecting the matter. The explanation of the mystery is found in the fact that the sugar dealers have stolen one of the arts of the laundry, and undertaken to hide the yellow color of low-grade sugars by means of bluing, just as the laundry woman makes yellow clothes look whiter by the use of indigo. The coloring matter used by refiners is that known as ultra-marine blue. This chemical compound cannot be recommended as an article of food. Hence, we would suggest that all sugars possessing a bluish tinge should be discarded.

Gilding Steel.—Polished steel may be beautifully gilded by means of the ethereal solution of gold. Dissolve pure gold in *aqua regia;* evaporate gently to dryness, so as to drive off the superfluous acid; redissolve in water, and add three times its bulk of sulphuric ether. Allow to stand for 24 hours in a stopped bottle, and the ethereal solution of gold will float on the top. Polished steel dipped in this is at once beautifully gilded, and by tracing patterns on the surface of the metal with any kind of varnish, beautiful devices in plain metal and gilt will be produced. For other metals, the electric process is best.

"Pebble" and "Glass" Spectacles.

The question is often asked, "What is the difference between 'pebble' and 'glass' in spectacles, and how may I distinguish the one from the other?" "Pebble" is much preferable, from the fact that it is harder and less liable to be scratched. A careful examination of the two, after a few months' use, will show this. "Pebble," which is made from the finest of large quartz crystals, by sawing into slabs, grinding and polishing, is much more transparent than glass. This is shown by placing a pebble lens between two plates of tourmaline, to polarize the light, when the light will readily pass through. But if the very best of flint or crown glass is subjected to such a test, the light will not pass, showing the greater transparency of the former.

A glass may be quite readily distinguished from a pebble lens by applying first the one and then the other to the tip of the tongue. The pebble will be found very sensibly colder than the glass.

Sometimes pebbles are cut, either through ignorance or a desire to cut them to the best advantage, at right angles to the axis of refraction; in all such cases the rays of light are split up in passing through the lens, and are therefore injurious to the eye. The crystal is sometimes defective in formation, not homogeneous or of stratified growth. Lenses made from such pebbles are little, if any, better than glass. In purchasing, buy only of an established dealer, who thoroughly knows the quality of his goods, and who will not endanger the eyes of his customers for the sake of a little iniquitous gain.

Presence of Mind.—A fire started a short time ago under the counter of a prominent drug-store on Chestnut street, Philadelphia. A cool-headed clerk, remembering the soda-water fountain, sent promptly to the cellar for a piece of India-rubber gas tubing, and slipping one end of this over the nozzle of the soda-water fountain faucet, turned on the tap, and immediately he had a powerful head of water highly charged with carbonic acid gas, the first dash of which on the fire put it out entirely.

To Solder Brass and Iron with Soft Solder.—Dissolve zinc in muriatic acid until action ceases. Reduce with water, and apply to the surfaces to be soldered. If the brass and iron are clean there will be no difficulty in soldering them together with a soldering iron or blowpipe.

Good Health.

Manageable Anæsthetics.—Paul Bert has been experimenting upon the anæsthesia of animals with mixtures of variable proportions. He calls the interval between the anæsthetic dose and the mortal dose the manageable zone, and his experiments seem to indicate that in all cases the mortal dose is just double the anæsthetic dose. If the mixture represents about the middle of the manageable zone, an animal is quieted very rapidly, and remains tranquil during the whole time of the experiment, even if it lasts for two hours. A few drops of the liquid, if they are breathed without a proper mixture of air, may suffice to carry the patient from the manageable to the mortal zone. Most anæsthetics seem to act, not by the quantity, but by the proportion which they hold to the air that is breathed. It seems probable that these proportions may be so exactly ascertained that all anæsthetics may be used with perfect impunity.—*Comtes Rendus.*

A Good Laugh.—What a capital, kindly, honest, jolly, glorious thing a good laugh is! What a tonic! What a digester! What a febrifuge! Better than a walk before breakfast or a nap after dinner. How it shuts the mouth of malice and opens the brow of kindness! How, like a thing of beauty, it is a joy forever; there is no remorse in it. It leaves no sting except in the sides, and that goes off. Even a single unparticipated laugh is a great affair to witness. But we are glad it is seldom single. It is more infectious than scarlet fever; you cannot gravely contemplate a laugh. If there is one laugher and one witness, there is forthwith two laughers. The convulsion is propagated by sound. What a soul-inspiring thing it is when it becomes epidemic.—*Good Health.*

Boys Smoking.—Mothers have a duty to perform toward their boys in teaching them to avoid tobacco. Some investigations by Decaisne, of Paris, may help them in the discharge of this duty. Ducaisne examined a large number of young smokers, and found the following symptoms evidently due to this habit: Palpitation, intermittent pulse, chloroanæmia—besides this, the children showed impaired intelligence, became lazy, and were disposed to take alcoholic stimulants. The latter effects are worse than the first, and no doubt grow out of them.

Cure for Ringworm.—It is said that a sure cure for ringworms is found in the use of a wash, prepared by soaking a bit of chewing tobacco the size of a raisin, with the same quantity of saleratus, in a spoonful of vinegar. Apply the wash faithfully for several days, until the skin is restored to its natural state. This remedy never fails, even in cases of open sores of enormous proportions.

Action of Coffee and Sugar on the Stomach.

M. Leven has communicated to the Paris Society of Biology, some experiments which he has made on this subject on dogs, with the assistance of M. Semerie. The action of coffee on the stomach has been much discussed and variously interpreted. The majority of writers admit that coffee stimulates the circulation and provokes hyperæmia of the gastric mucous membrane; but they have not adduced experimental proof of the fact.

The contrary opinion is supported by a certain number of observers, to whom M. Leven has given in his adhesion. He recalls to mind the experiments which he made some years since on caffeine absorbed by frogs, guinea pigs and rabbits. It retarded the action of the heart, which, at the same time, became strong; it increased the arterial tension; like the vaso-constrictor agents, it dilated the pupil. Caffeine has even been used in certain cases to replace digitaline, of which it has, to a great extent, the properties, though in a smaller degree.

The latest experiments of M. Leven were as follows: He gave to a dog a meal of 200 grams of meat; he then administered an infusion of 36 grams of coffee in 150 grams of water; the animal was then killed, and, at the end of three hours, the stomach still contained 145 grams of meat, while in the absence of coffee it only contained about 100 grams. The abdominal mucous membrane was pale as well on the external surface as in the interior, and the vessels were strongly contracted. It follows, then, that coffee, producing anæmia of the stomach, retards digestion; and, the anæmia repeating itself, ends by bringing on habitual increased congestion of the stomach, which, according to M. Leven, is synonymous with dyspepsis.

It is well known, and English physicians have laid great stress upon this point, that the abuse of coffee and tea often brings on gastralgia, dyspepsia, and, at the same time, more or less disturbance of the apparatus of innervation. It is, therefore, necessary precisely to distinguish the local anæmia produced by coffee on the stomach from the more general action exercised by it over the central nervous system, and which has conferred on it the merited qualification of an intellectual drink. In opposition to coffee, sugar is, according to M. Leven, an eminently digestive substance, and he does not fail to order it in certain cases of dyspepsia. He has made the following experiments: He gave to a dog 80 grams of sugar at the same time as 200 grams of meat; six hours afterward there was nothing found in the stomach but 20 grams of undigested meat. The abdominal mucous membrane was red and turgescent; the liver was wholly congested.

M. Leven draws this practical lesson from his experiments: That the infusion of coffee should be sufficiently sweetened to stimulate the secretory function, and thus assist digestion.—*British Medical Journal.*

Warm Milk as a Beverage.—Milk that is heated to much above 100° F., loses for a time a degree of its sweetness and density. No one who, fatigued by over-exertion of body and mind, has ever experienced the reviving influence of a tumbler of this beverage, heated as hot as it can be sipped, will willingly forego a resort to it because of its having thus been rendered somewhat less acceptable to the palate. The promptness with which its tonic influence is felt is indeed surprising. Some portion of it seems to be digested and appropriated almost immediately; and many who fancy they need alcoholic stimulants when exhausted by fatigue, will find in this simple draft an equivalent that will be abundantly satisfying and more enduring in its effects.

Cold Draughts vs. Cold Baths.—Dr. Dio Lewis says cold baths of the skin are good, but it is doubtful if flooding the stomach on going to bed and on rising is not, on the whole, the most profitable form of cold bathing. Costiveness, piles and indigestion are uniformly relieved by this morning and evening cold douche. The quantity must be determined by each one for himself. Two or three swallows will do to begin with, but the quantity will soon grow to a tumblerfull; and I have known persons to use much more with marked benefit. If advisably managed every dyspeptic will be greatly improved by this cold stomach bath.

Artificial Bone.—A young lady in Erie, Penn., has been troubled for some time past with a malignant cancer on the right side of her lower jaw. The physicians have decided to remove the jaw and insert a celluloid jawbone to replace the one taken out. This has been done but two or three times before, it is claimed, and the result of the combined operations is being watched with the greatest interest by the medical profession.

To Take the Gold Plate off a Silver Watch.—If the plate is thin dip it momentarily in a little mercury and rub with a piece of soft chamois leather. Repeat the dipping (in fresh mercury) several times, or until the gold color has been removed. Then heat the case until the film of mercury adhering to the silver has been dissipated. The mercury should not be allowed to remain too long in contact with the silver, The case should, of course, be separated from the works before being operated upon.

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Passing Events.

The heavy and frequent showers of rain, which have been falling during the past week, bring renewed assurances of a prosperous season for both miners and farmers.

The greatest event of the week, is the result of the long-pending trial of the murderer of President Garfield; and most persons will feel relieved to know that a verdict of "guilty as charged," has been found against him.

THE MINING AND SCIENTIFIC PRESS this week consists of 24 pages, and our readers are reminded that this number is one worthy of preservation for future use. Our annual review fills nearly five closely printed pages, and it gives in a comparatively brief space a resume of the condition of the mining industry over a very large territory.

We have compiled, also, such statistics of bullion production, etc., as would be interesting in this connection. The latter work shows a great deal of information in brief space. Although this review may seem somewhat extended, it is really brief, when the ground covered by it is considered.

Judging from the result of the year's work, we may expect a very much larger yield next year. Hundreds of prospectors will, in the spring, encouraged by discoveries of last season, start work in the mining regions. Altogether, the outlook is favorable.

THE Central Pacific Railroad Co. has declared the usual semi-annual dividend of 3%, payable February 1st.

Drift Mining.

The Gravel

Is broken or breasted out from that side of a block furthest from the main drift, the length of face of the breast being the distance between the cross drifts. Only the finer gravel is thrown into the cars and taken out of the mine, the large bowlders being piled in the worked-out ground. As soon as the gravel has been breasted out to a distance of about seven or eight ft., the tramway track is moved from the drift to this space, thus bringing the cars close up to the face again; the drift is then utilized for piling up the waste rock and bowlders. When the face is again worked off seven or eight ft. in depth, the track is moved, and the cars brought up to the gravel, and the work is so carried on till the entire block is removed. The worked-out space becomes more or less filled with bowlders, according to the nature of the gravel deposit. As a general rule, the depth of the gravel on the bedrock containing sufficient gold to pay for drifting is not over four to six ft. Occasionally it is more—12, 16, and even 30 ft. in depth. Again, while that portion immediately on the bedrock containing gold may be only five or six ft. deep, at a comparatively small distance above, 20 or 25 ft., may be another stratum of gravel that will pay to drift. These such pay streaks are, known and worked in the Paragon, or Breece and Wheeler drift mine at Bath, in Placer county. First, about 6 ft., immediately on the bedrock, then some 10 or 15 ft. higher, a stratum of pay of about the same thickness, then a third seam, 150 ft. above the bedrock; this latter worked through a separate tunnel. Where 10 ft. or more depth of gravel is mined, the breasting is done in two or more benches. Very long timbers are used, and if the gravel is at all soft, and liable to cave, great care must be taken to place them and the lagging properly. Except where the gravel is very hard and cemented, considerable timbering is required. In many mines, in addition to timbers and caps placed quite closely together, it is necessary to use capa and top lagging, driving the latter ahead of the timbers, and close up to the face, as the gravel is removed from it. Blasting is not required, except in extremely hard and cemented gravels. As far as practicable, the gravel is broken out with the pick, as it is difficult to use powder advantageously.

The Cars

And track used in the gravel workings, where they discharge through shafts to a lower bedrock tunnel, are somewhat different in construction from those used for carrying the gravel to the dump, either directly from the workings or in the lower tunnel. The track in the workings, having to be moved often, is made in sections, so that it can be taken apart and put together without difficulty. Sometimes only wooden rails are used, but generally they are faced with a light strap iron. The cars are smaller, the dimensions varying in different mines; a convenient size has a box 5 ft. long, 24 inches wide and 20 inches deep. The carrying capacity varies from 600 or 700 lbs. to one ton. In the working tunnel, and in all drifts permanently used, the track should be well made. The wear and tear is considerable, and frequent repairs and renewal are necessary. The wooden rail, faced with strap iron, is in general use, but is beginning to be replaced in some large mines with long tunnels by a light T rail, weighing about 30 lbs. to the yard. Strap iron, for facing the wooden rails, 2 inches wide by ¼, ⅜ or ½ inch thickness, is oftenest employed, but iron one inch thick, is found to be much superior. The gauge of the track varies from 16 to 22 inches. The size of car is double or more in capacity over that used in the workings, carrying from 20 to 36 hundred weight. The cars are, as a rule, constructed of wood, oak being found the most durable. Iron cars are used to some extent, and are in every way superior, combining the three advantages of greater durability, economy of power in running and less weight than wooden cars of the same carrying capacity. In the mine the miners run the cars, dumping the gravel into the upraise, which, being closed with a gate at the bottom, holds the gravel till an empty car is placed in position to be filled from it. In the working tunnel a special force is best employed for running the cars out of the mine, particularly where the distance of carriage is great. Horse or mule power is much cheaper where much gravel is taken out, as several cars can be linked together in a train, and instead of one man to each car, one man and horse can handle a train of five or six cars. In a mine in Sierra county a small locomotive is used, and found to work well, but except where the amount of gravel to be handled is very large and the distance considerable, horse power would seem to be the most economical.

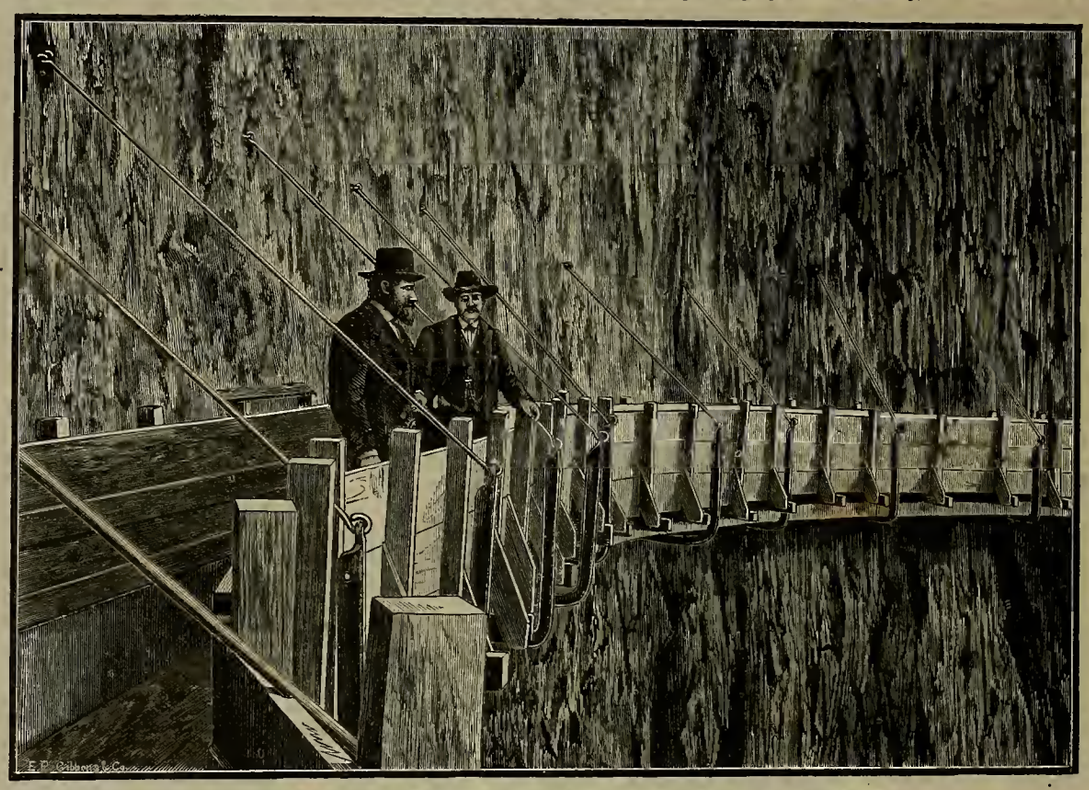

FIG. 2.—METHOD OF HANGING FLUME TO CLIFF BY IRON BRACKETS.

The Dump

For the gravel outside of the mine and the washing plant is variously arranged, according to the natural facilities it is possible to utilize. Assuming that the tunnel enters the mine from the head of some steep ravine, we have it in about its best position for dumping and washing arrangements. Directly in front of the entrance to the tunnel is the tank in which the mine waters are retained. This tank is made in the most convenient dimensions, and usually large enough to hold the accumulated flow of twenty-four hours. Below this tank, and running down the bed of the ravine, are the sluice boxes. The track leaving the tunnel divides into two or three branches; the main central one crossing the water tank is continued on a trestle over the boxes to the dump. The dump is made by covering the sloping sides of the ravine with planks and sheet iron, so that the gravel slides into the boxes during the washing. The second branch runs along one side of the ravine, and is used for taking gravel from drifts and ground it is desired to prospect to a special dump, so that it can be separately washed. The third branch runs along the other side of the ravine to such a distance as to be clear of the sluices, and is used for the cars containing the waste rock from the main tunnel. This is dumped where it will be out of the way. At some mines only two tracks are run, one on each side of the ravine, or one in the middle and the other on one side, the latter having a dump for gravel it is desired to prospect and one for waste rock. Sometimes in small mines only one track on the side is used for all three purposes. These tracks and the entrances to the tunnels are generally roofed over, as a protection from snow and rain. The washing is done once a day, oftener if the quantity of gravel is very large, and the sluices cleaned up immediately, as a precaution against robbery. The gold being, as a rule, coarse and heavy, requires no quicksilver to save it, a little is sometimes placed in the lower boxes to assist in securing fine particles of gold, that might otherwise float off.

Immigration Association of California.

Persons intending to come to California, and desiring information concerning various parts of the region, can, by writing to the above-named association, receive such information, with reference to land, climate, soil and productions, as may be useful to them. The association is incorporated under the laws of this State. It has no connection with any land or other private scheme, its object being solely to exercise an influence on the immigration into California, and to aid in a proper development of the State.

It is the intention of the association to obtain and disseminate such information as can be obtained from reliable sources in reference to lands which may be profitable; climate, character of soil and its productions; opportunities for obtaining building material and fuel; water supply, transportation facilities; location with reference to markets, towns, schools, etc., and any and all practical information (with maps and statistics of California) which may be beneficial to immigrants seeking homes; to have the same compiled and published in different languages, when necessary, and distributed in the States east of the Rocky Mts., and in Europe.

The Directors of the Association are: Arthur R. Briggs, President; Wm. L. Marry, Vice-President; W. Stsinhart, Treasurer, and James R. Kelly, James Duffy, Wm. Blanding, W. N. Hawley, T. L. Barker and J. V. Webster. The Secretary is Col. A. W. Preston, and the Land Officer is C. H. Street. The office of the Association is No. 10 California, a short distance from the ferries, California opening into Market near the lower end of the latter street.

People coming to California who expect to engage in mining, must not expect to come here and find a mine in a day or two; nor when they find a "ledge" can they make a living out of it without the expenditure of time, labor, and some money. Nor are mines to be found everywhere. The older counties, such as Nevada, Placer, El Dorado, Tuolumne, Calaveras, Amador, Yuba, Sierra, and Plumas, have been pretty well run over by miners for 20 years. To get mines in those regions, people have to buy them. True there are hundreds of "prospects" which will become mines only when a good deal of work is put on them. Hundreds of such claims may be purchased cheap. In the lower counties, such as Mono, Inyo, San Bernardino, Kern, Tulare and Fresno, there is yet considerable ground only partly prospected; and even in the first-named counties, of course, mines may be struck.

There is now no sharply-drawn line between agricultural and mining counties. In nearly all the mining counties, more or less, agriculture is carried on. In many places mining and farming are done side by side. In the valleys of all the mining counties fruit, vine, vegetables or grain are grown. Men who come to mine here now, however, cannot do as in early days, when pan and rocker made fortunes for their owners in a short time. Now, diligent labor is required,

Mines and Mining in 1881.

A Review of the Reeults of Work for the Year.

Never before in the history of the conntry has thers been a year so marked for advance in the mining industry as that of 1881. This is not so mucb noticeahls in the hullion product, for 1881 only exceeds 1880 by $4,366,481; but in ths increase of area of ths territory nndsr process of dcvelopment. Idaho, Montana, Arizsna and New Msxion ars all widsning their fields of labor. Some of the camps in thsse rsgions have very much increassd in importance within the year, noticsahly, Tombstsns, Butte and Wood River.

Up tn within the past fsw years ths States nf California and Nevada have ovsrshadowsd all the others in the mining intcrests. Now thsse twn States ars hy no means so much ahsad of others. Coloradn heads ths list, California coming second and Nsvada third.

It ie as well at tbis time to oall attention to the faot tbat a great deal has been written abont Idaho, Montana, New Mexico and Arizona, wbicb depioted mining matters in those Territories as they will be rather than as they are. It might have been supposed by many that California, for instance, was a played-out mining region. Yet results show that she is seven millions ahead of the State below her, which is hetween two and three millions ahead of the next one below. This, for a played-ont State is pretty good. Moreover, California last year did not have a fair chance, eince many of her largest hydranlic minee were closed down hy injunction a part of the time. In fact, the only thing we have to deplore for the period under review is the unfortnnate litigation shont the debris qnsstion. The great suit now going on will soon he settled, however.

The Bullion Product.

As a matter of interest, we append a tablo, which we get from the Superintendent of the U. S. Branch Mint, in this city, showing the hullion product for the *fiscal* year ending June 30, 1881:

	Gold.	Silver.	Total.
California	$17,295,323	$757,525	$18,742,848
Nevada	2,534,792	7,776,818	10,311,610
Arizona	554,517	7,796,306	8,350,823
Idaho	1,541,652	1,068,916	2,620,568
Oregon	753,613	79,671	823,284
Washington	90,000	.....	90,000
Alaska	1,900	.....	1,900
Totals	$23,462,797	$17,479,236	$40,942,033

A peculiar significance of thie table lies in the fact that it is made up of figures from the actual returns made hy mine owners to the Superintendent of the U. S. Mint. It is, therefore, free from "estimates," which may he more or less carefully made. We are cognizant of the very great care taken hy the gentlemen in charge of the statistical department of the mint, to get all the details of hullion product in the most accurate manner. Therefore the tables compiled by them are made on information of the most reliable character.

For the hullion product retnrns this year we are indehted to Mr. John J. Valentine, General Superintendent of Wells, Fargo & Co., who compiled the tahles we gave last week and which we repeat below:

Statement of the Amount of Precious Metals Produced in the States and Territories West of the Missouri River, including British Columbia (and Receipts in San Francisco by Express from the West Coast of Mexico), During the Year 1881.

States and Territories.	Gold Dust and Bullion by Express.	Gold Dust and Bullion by other conveyances.	Silver Bullion by Express.	Ores and Base Bullion by Freight.	Total.
California	$16,349,215	$817,400	$348,582	$3,5,421	$18,090,679
Nevada	35,446		7,755,774	3,806,428	11,847,564
Oregon	660,931	580,000	45,684		1,189,615
Washington	67,360	13,000			100,063
Alaska		33,554			13,000
Montana	1,066,540	417,239	500,540	1,007,365	2,991,684
Idaho	1,166,240	116,336	2,965,729	1,007,365	4,854,474
Dakota	98,959		3,963,610	3,637,383	7,699,952
Colorado	1,907,160	325,000	2,920,000	18,230,000	23,382,160
New Mexico	32,944	137,252	77,000	705,000	952,196
Arizona (west coast)	3,295,940				3,295,940
Arizona (Mexico)	348,127		1,578,805		1,926,932
British Columbia	757,600	115,000	1,209,215	1,301,000	3,382,815
	$16,349,215	$817,400	$348,582	$3,5,421	$18,090,679
	35,446		7,755,774	3,806,428	11,847,564
	660,931	580,000	45,684		1,189,615
	67,360	13,000			100,063
		33,554			13,000
	1,066,540	417,239	500,540	1,007,365	2,991,684
	1,166,240	116,336	2,965,729	1,007,365	4,854,474
	98,959		3,963,610	3,637,383	7,699,952
	1,907,160	325,000	2,920,000	18,230,000	23,382,160
	32,944	137,252	77,000	705,000	952,196
	3,295,940				3,295,940
	348,127		1,578,805		1,926,932
	757,600	115,000	1,209,215	1,301,000	3,382,815
	$26,019,223	$2,663,910	$27,567,824	$30,233,430	$84,004,417

Compared with the report of the same anthority for 1880, California showe a decrease in gold of $579,069, and an increase in silver of $323,-582. Nevada shows a total falling off of $3,-184,057; the yield from the Comstock being only $1,726,162, as against $5,312,592 in 1880—a decrease of $3,586,430. The prodnct of Enreka district is $4,127,265, as against $4,639,025 in 1880—a decrease of $511,760. Utsh shows an increase of $860,335. Colorado shows an increase of $1,672,171; and Arizona $3,726,395 ovsr tbe report nf last year.

Annual Products of Lead, Copper, Silver and Gold in the States and Territories West of the Missouri River, 1870-81.

Year.	W. F. & Co.'s Statements, including Amounts from British Columbia and West Coast of Mexico.	Product after deducting Amounts from British Columbia and West Coast of Mexico.	The Net Product of the States and Territories west of the Missouri River, exclusive of British Columbia and West Coast of Mexico, divided, as as follows:			
			Lead.	Copper.	Silver.	Gold.
1870	$54,600,000	$53,150,000	$4,687,000		$17,330,000	$33,750,000
1871	58,284,000	55,784,000	2,100,000		19,236,000	34,388,000
1872	62,226,369	60,351,324	2,250,000		19,924,429	38,177,395
1873	72,218,693	70,139,860	3,450,000		27,483,302	39,206,558
1874	74,401,045	71,985,610	3,500,000		30,699,122	38,456,883
1875	86,078,425	83,703,425	5,040,000		37,289,924	41,373,501
1876	90,687,167	87,276,167	3,452,000		42,888,038	41,936,129
1877	99,431,754	95,811,892	5,085,250		44,616,109	44,880,223
1878	81,154,622	78,276,167	3,452,000		37,248,137	37,576,030
1879	75,319,501	72,683,883	4,185,769		37,032,857	31,470,262
1880	80,167,936	77,232,512	5,743,390		38,033,064	33,456,059
1881	84,904,417	81,198,474	6,361,502	$806,000	42,387,613	30,639,359
				1,196,000		

We give, in other parts of thie review, the reports of hullion product from varione localities.

California.

Ae we devote from two to three columns per week to condensed statements of the progrees of the different counties of the State as regards mining development, it would scarcely be possible for us to give in readable space, in a general review of this character, a statement of the condition of the various mines in the different connties, moreover it is exceedingly difficult to ohtain reliahle statietics nf yield by counties. There are so many companies in this State that are nnwilling to have the detaile of their hnsinsss made public that we have consequently given up any attempt to give detailed yields by conntiss. It would be mere guess-work half the time, and we prefer to give only the aggregate amount as shown hy the hullion shipments made through the express company.

The following table shows, with the authorities, the total yield of precious metals in California from 1848 to Jan. 1, 1882:

Precious Metals in California.

Year.	Amount.
1848 }	$15,000,000
1849 }	
1850	45,000,000
1851	75,000,000
1852	85,000,000
1853	75,000,000
1854	65,000,000
1855	68,500,000
1856	65,000,000
1857	57,600,000
1858	50,000,000
1859	50,000,000
1860	45,000,000
1861	40,000,000
1862	34,700,000
1863	30,000,000
1864	26,600,000
1865	28,500,000
1806	25,500,000
1867	25,000,000
1808	22,000,000
1869	22,500,000
1870	25,000,000
1871	19,679,224
1872	19,050,098
1873	18,025,722
1874	20,300,531
1875	17,758,151
1876	18,615,807
1877	18,174,716
1878	18,920,461
1879	18,190,973
1880	18,270,166
1881	18,020,679

	Gold.	Silver.
1848 to 1857, Garnett	$ 548,100,000	$ .....
1858 to 1870, Raymond	424 800,000	.....
1871 to June 30, 1881, Valentine	190,096,076	14,914,452
	$1,162,992,076	$14,914,452
	14,914,452	
Total	$1,177,906,528	

This makes an aggregate of nearly 1178 millions.

Soms few points rsgarding the prominsnt mining regions shonld he tonched npon, however.

If we take ths last report of the Director of the United States Mint ss a basis—and we havs no othsr sonrce for informstion of yisld hy counties—Nevada yields the hannsr to Mono. According to his statistics, in 1880, Mono yialded $2,990,-141, while Nsvada county yielded $2,722,506. This was ysar hefors last, hut the stoppags of many hydranlic mines in Nevada conty must have redncsd ths yisld this ysar. Notwithstanding, that conuty, Nevads, is in a prosperons condition, more sspecially its qnartz mining interests. Ths *Transcript* says:

Ths quartz mining interests of Nsvada county are in a most sncouraging condition. In this district, hy which we mean Nevada township, nearly 200 stamps are dropping, and ths nnmhsr is heing iucreassd from month to month. The numerons live enterprises, old and new, that are adjaoent to Grass Valley, ars mostly prospering, and several nsw prodncsrs will hs opened there alsn before many months. In all other parts of the county, where anriferous qnartz deposits shonnd, the same indicatione of activity in this hranch prevail. Even the Meadow Lake conntry is gradually passing from under the clond that has hung over it so long, and hefore lnng, we hope to chronicle that the ores there, which have heretofore proved so rebellions, are yielding up their treasnre at the touch of science. The drawhacks that hesst hydraulic mining will he removed soon, we trust. The scarcity of water this winter is not satisfactory, hut onr people are hopeful, and find consolation in turning their faces towards the near futnre, which is hright with hope.

In this county ie the representative gold mine of this State—the Idaho mine. We gave, not long since, the annual report of the mine, ehowing some very interesting figures. For something over 13 years, the mine has been paying regular monthly dividends, having in that time dishnrsed to stockholders $3,101,550, out of a gross product of $6,780,295.60; the total number of dividends heing 148, in value to 1000½% upon the capital stock. The past year has hean one of great prosperity with the mine, heing the hest since 1874, and the third hest since the mine commenced paying dividends. In 1873, the product was $1,010,612 20; in 1874 $669,023-.03, and in 1881, $640,107.58. The prodnct of 1881 was $199,761.59 greater than the yield of 1880, showing improved condition of the mine in its deepest workings, which have extended down to the 12th level, over 1,500 ft. on the incline and over 1,300 ft. in perpeudicular depth. At these depthe the ledge has continned to hold its average width, and has decidedly improved in quality, as shown hy the yield of the ore for 1881, the average per ton heing $22.95½, as against $15.82 per ton for 1880; while the average cost per ton for mining end milling has hut slightly increased, hsing $9.29½ per ton in 1880, and 9.51 1-9 per ton in 1881. All the profitable ores of the mine for the past year have heen from the No. 11 and the No. 12 levels, and the stopes connected therewith, as the levels ahove are nearly exhausted. The history of this mine is sufficient to demonstrate the value of the mineral resources of the district.

Bodie district, in Mono county, vies with Nevada conuty in hullion yield. It is hardly worth while for us to go into any detaile concerning its mines, in view of the fact that we have presented each week the current news. As to yield of hullion, the *Free Press* of the 10th inst said: It will perhaps he a surprise to many of our readers, hut it is nevertheless a fact, that the hullion shipments from Bodie dnring the year just closed were the largest of any year since the revival of the district. They amounted to the sum of $3,173,000. Thie is an increase of more than $100,000 over those of 1880, of more than $600,000 over those of 1879, and of more than $1,000,000 over those of 1878, which was the year of greatest excitement in Bodie mines. The shipments for the five years ending Decemher 31, 1881, have been as follows:

1877	$ 973,022 80
1878	2,129,722 53
1879	2,556,847 58
1880	3,063,699 13
1881	3,173,0.0 00
Total	$11,952,302 09

Before the middle of the present month Bodie district will have made the grand record of $12,000,000, added to the permanent wealth of the world. We are of the opinion that the yield of the present year will he fully equal to that of 1881, and there is good reason to anticipate that it will he larger. The prospects of opening up a new honanza are exceedingly good, particnlarly in the south end of the camp. Outside districts in the neighhorhood of Bodie are attracting much attention, and more activity than usual is anticipated in Homer district during the coming eeasons, where several new combinations of capital will enter into mining operations. The Sweetwater minee, ahont 20 miles north of Bodie in an air line, it is confidently predicted, will create a furore of excitement during the present season. Dr. Summers' mill started np on rich ore on Monday. The Aurora mines will have an opportunity of making a stir under the impetus of milling facilities, as the Humholdt mill will be in operation before the end of the present month. Altogether, there is every prohability of an unusually hrilliant year in mining in Bodie and the surrounding country.

Up in El Dorado conuty they ssem tn hs prstty wsll snconraged in thsir work. The Gsorgetown *Gazette* says: The ontlook for this divide during the nsw year is qnite encouragiog. A number of enterprises ars in vogus, which will give employmant to many of our laborers, and add materially to our financial condition. Ths mining ontlook is certainly hrighter than it has been for years, particularly quartz mining. No less than 30 qnartz locations have hssn recorded in this district alone during the past year, and locations ars still heing made. The Cal. W. & M. Co. continuss to carry forward its great work of permansnt improvements npon its ditch property. Kelsay, Garden Valley, Grssnwood and Volcano districts, ars all making progress in ths quartz mining industry. Thess districts have all added new mills, and started np idle onss within ths past year, and we hear of more mills and mining machinery which are to hs added to all of those mining districts within ths nsxt six months. The mines of Spsnish Dry Diggings continue to hold their own. Georgstown district is not bshind, in fact present indications are that this district will stand ehead of any in the county hefore the close of 1882. The *Mountain Democrat*, of the same conuty, says: Business, on the whole, is hetter than it has been for many years. The mining induetry especially ie greatly revived. More quartz mills and hoisting works have been put up within the past year than within any other year since the conuty was organizsd, and the numhor of new mining enterprises started within the year, is without a precedent.

Of Placer county, we have had considerable to say of late, and refer the readers particularly to a letter from Russel L. Dunn, published in a recent issne, giving many intersating facts concerning the county. In his testimony hefore the Superior Court of Sacramento county, in the case of the People vs. the Gold Run Ditch and Mining Co., J. B. Hobeon, a miner of Iowa hill, testified in reference to the extent of the mining operations in that district, and the yield to date of various Iowa Hill mines, as follows: There has been mined into the North Fork, above Rice's hridge, 3,585,800 cnbic yards of material from the Iowa Hill mines—ahont 31 acres. At the mine on Independence hill, during the three seasone, we worked 278 days, and nsed 500 inchee of water. We took out $66,529. The expenses of the mine were $35,450, and the net proceeds, $30,977. The following amounts have been taken out in thet vicinity: North Star and Weisler claim at Iowa Hill proper, $2,000,000; Wolverine mine at Roach Hill, $800,000; Shelhy, $105,000; Columhus, $100,000; Dayton, $156,000; Phillips, $80,000; Morning Star mine at Morning Star Hill, $250,000; Bird's Flat mines, $200,-000; Strawberry Flat, $100,000; Wisconsin Hill, $550,000; Grizzly Flat mines, $350,000; Sucker Flat, $250,000; total from Indepsndsnce Hill mines, $100,000; Mountain Gate at Damascus, $1,500,000; total, $6,541,000. The production of the Mountain Gate mine at present varies from $3 to $5 per load—ahout $40,000 per acre.

The Placer *Herald* says: The amount of gold dust shipped through the office of Wells, Fargo & Co., at Auhurn, for the year 1881, aggregates $281,379. This all came direct from the mines, and is so much added to the circulation of the world. It is not as though this much had heen taken from one channel of trade and put into another, hut it is this much that never existed in circulation hefore added to the channals of all classes of trade. It would not seem from this showing that the minee were entirely worked ont. On the contrary, it is donhtful whsther the gold product of this part of the country has for a number of years exceeded the annual yield indicated hy these figures.

The Calaveras *Chronicle*, published at Mokelumne Hill, in spsaking of the region thereahout, says:

While we do not expect to experience the animation of '52, yet to an approximate degree we opine that this dull, quiet, little hurg, Mokelumne Hill, will, within the next year or two, become again the center of great mining notivity. The class of mining that made us what we were, viz., placsr, will not in the fnture, as hefore, he the only feature. Quartz mining ie destined to become the etrong lever that will raise our almost razsed town to its old-time quarters. The oldest inhahitant has long known, and the world at large is coming to know, that our hig county, with its 1,100 square miles of territory, the greater portion of which embraces mountain ranges composed of gold-hearing formations, is traversed hy a network of auriferous quartz ledges, not numhered by the score, but hy hundreds. These mountains are not harren, desolate hills devoid of timher and water, those great essntials to profitahle mining.

As to the healthfulness of this region, the glorious climate of California, of which everyhody has heard, settles that question. Railroad facilities heing good, the most remote of our mines are within one day's journey of the great metropolis hy the sea. Substantial wagon roads, already constructed, make accessible every part of the county.

Nevada.

The yield of Nevada last year, $11,847,564, shows a total falling off of $3,184,057; the yield from the Comstock hsing only $1,726,162, as against $5,312,592 in 1880—a decrease of $3,-586,430. The prodnct of Eureka district is $4,127,265, as against $4,639,025 in 1880—a decrease of $511,760. If we remembsr aright this is the lowest yield of the Comstock eince

its discovery. In 1880 the Consolidated Virginia mine alone yielded $1,756,536, which is more than all the mines in the lode turned out in 1881; in addition, the California produced $890,515, the two mines yielding an aggregate of $2,647,151. This is the second year only when Nevada has not been the leader in bullion product for many years and it is even now third, following California and being over three millions and a half ahead of Arizona, which comes next to it. This, for what some people wrongly suppose to be a played-out mining State, is very good.

The great need of Nevada at present is a means of working low-grade ores. There are thousands of tons of such ores all over the State, and more particularly on the Comstock, but by processes at present known it is impossible to work them at a profit. They contain, however, sufficient metal for a profit if worked at a low price.

The extent of territory within the Nevada borders, nearly all of which is mineral-bearing, precludes the possibility of our mentioning the various districts. The Comstock and Enreka are the two principal ones. There are, of course, very many others, which we have mentioned from week to week in our "Mining Summary." The extension of railroad facilities is gradually bringing into notice and prominence several camps, which promise abundant returns for investments.

We have before given the yield of Nevada for 1881, and the following table will give an idea of the sources of this yield. This table shows the results of mining product for 12 months, ending September 30th, 1881, and is that from which the tax levy is based. Although it only comes up to September 30th, it gives a good idea of the comparative yield of the different counties. For once Eureka county is ahead of Storey (where the Comstock mines are).

COUNTIES.	Quantity Worked. Tons.	Lbs.	Gross Yield or Value.	Net Yield on which Taxes are Levied.
Ores.				
Elko	3,333	1,473	$321,906.08	$64,344.35
Esmeralda	37,398	1,297	1,490,457.42	406,898.79
Eureka	77,005	191	3,168,343.91	918,655.94
Humboldt	5,444	830	74,920.05	13,546.41
Lander	7,036	460	850,419.05	403,082.96
Lincoln	3,206	586	97,904.75	19,023.41
Nye	13,088	1,167	465,209.14	15,572.48
Storey	88,508	1,284	1,585,000.98	314,875.76
White Pine	8,299	359	365,952.30	76,189.11
Total Ores	243,316	1,647	$3,400,373.64	$2,322,394.20
Tailings.				
Humboldt	5,833	668	$20,170.15	$8,170.05
Lincoln	8,094	1,663	83,109.43	12,333.98
Lyon	77,096	.....	346,031.02	50,697.15
Ormsby	41,005	.....	179,405.02	56,370.54
Storey	37,912	1,000	178,560.64	26,027.11
Washoe	5,256	.....	39,533.42	4,036.15
White Pine	12,834	.....	41,740.44	4,174.05
Total tailings	188,841	1,329	$886,641.12	$162,709.04
Salt, Etc.				
Esmeralda	15,570	691	$209,956.61	$56,263.36
G'nd total for year	452,728	1,667	$3,503,971.41	$2,542,370.50
1877				
Grand total ores	728,810	194	$42,295,076.05	$23,738,726.79
1878				
Grand total ores	134,382	1,444	6,257,225.57	3,194,032.70
1879				
Ores, tailings, salt	183,220	1,338	5,112,175.12	2,161,961.34
1880				
Ores, tailings, salt	560,579	1,643	13,655,967.36	4,496,738.91

The above report will seem altogether unfavorable, except an explanation is given: In 1877, $42,295,076.05 was mostly from the Comstock. It was when the great Consolidated Virginia was doing its best. Mines outside the Comstock, we think, although we have not the exact statistics, have not fallen off in the amount of product, but increased, both in the gross yield and the net profits. As heretofore the greater efforts have been toward the Comstock, and that those famous mines are experiencing a comparative dark day, it is not wonderful that a wide showing should be made between the amount of bullion produced in the State when the Comstock produces largely and when but little. Mining in Nevada generally is gaining in interest, and although the yield the last year falls greatly below that of some previous years, the Comstock is liable at any time to resume her former status, which, with the increase of other camps, will carry the grand product far ahead of any year in Nevada's mining history.

Eureka this year takes the lead. The *Sentinel* points, with gratification, to what has been done in the two mines that have been most prominent in the history of Eureka district so far. The Eureka Con. has disbursed, in dividends, $4,705,000. The payment of dividends was suspended Nov. 1st, and the surplus funds on hand retained to pay for improvements that are being made—the sinking of a new shaft and the erection of new, extensive and costly works. The Richmond company has paid dividends up to the present, aggregating $3,564,000. This company also has a substantial reserve fund to meet all demands. The Geddes & Bertrand mining company is engaged in the construction of very extensive works to develop its property, thereby indicating its faith in the value of the mine. In many other mines a vast deal of important work has been done. Numerous strikes have been made during the year, all going to confirm the belief in the richness and permanency of the camp. The developments in the Eureka tunnel have done much to further strengthen this opinion, while the late discoveries in Prospect Mountain tunnel have well nigh turned speculation on the subject into settled belief. These discoveries have cheered the miner and given new life to the prospector. Work has been renewed on many old claims, and new ones have been opened. Unfortunate litigations have vexed the principal industry somewhat, but this trouble is an universal concomitant of mining

During the year a new railroad has been commenced, with Eureka for the construction starting point, and with Salt Lake as the present proposed terminus, but at which point it will become a part of one of the projected transcontinental trunk lines. That the building of this road is a bona fide enterprise, there seems to be no doubt. Vigorous work on this road is going on at present, at considerable expense, notwithstanding the inclemency of the season.

On this Comstock they are working away in hopes of finding a bonanza. The great bonanza mines, as they are called, found no extensive or rich bodies of ore either in 1880 or 1881. Vigorous prospecting has been carried on, however, not only in these two mines, but in the other more prominent ones on the lode. To show the expensive nature of the work going on, it is only necessary to quote from the report of one or two mines for the year.

The famous California mine, for the year ending Dec. 31, 1881, turned out 6,175 tons of ore, yielding bullion to the value of $122,107.26, or an average of $19.77 per ton, milling 79% of assay value. There was gold in bullion to the value of $82,146.10, and silver to the value of $39,961.16. There were raised 13,299 tons of waste rock. All the work done was of a preparatory nature. The following figures show receipts and expenditures of the mine:

RECEIPTS.

Bullion on hand at last annual statement	$ 34,359 03
Cash on hand at last annual statement	903.42
Samples on hand at last annual statement	65.92
Gross product of mine for 1881	122,182.32
Assessment No. 1	162,000.00
Overdraft Jan. 18, 1882, at Nevada Bank	74,630.25
Total	$394,140.93

DISBURSEMENTS.

Overdraft last annual statement	$ 9,804.50
Salaries and wages	55,580.76
Supplies	30,381.47
Hoisting	16,006.63
Compressed air	6,097.50
Sutro tunnel royalty	3,658.30
Suction fan	3,766.11
Assaying account	745.88
Team account	148.75
Taxes	2,856.14
Pumping expense	755.00
Bullion freight	465.20
Virginia City expense	1,330.08
C. and C. joint shaft	126,200.00
Real estate Virginia City	1,325.00
Interest and exchange	6,027.02
Legal expense	11,923.80
Advertising	4,657.25
Discount on bullion	10,104.91
Refining charges on bullion	994.74
San Francisco office expense	3 757.55
Books and stationery	580.20
Cash on hand	1,174.52
Samples on hand	14 36
Total	$394,140.93

The Consolidated Virginia mine turned out 6,435 tons of ore in the year, yielding $144,-064.10 or $21.13 per ton. There were also 8,-307 tons of waste rock taken out. In our last issue we gave a summary of the work done in this mine, and now append tables showing the receipts and expenditures:

RECEIPTS.

Dec. 31, 1880, cash on hand	$ 1,569.50
Samples on hand	154.40
Assaying	6,284 19
Supplies	11 382 33
Best & Belcher joint work	14 023.94
Drafts on secretary	320,365.05
Samples produced	104.40
Suction fans	13,303.10
Total	$367,792.98

DISBURSEMENTS.

Salaries	$ 6,000.00
Wages	83,079 50
Timber	7,793 72
Ice	6,547.92
Candles	2,240.35
Powder, fuse and caps	5,966 64
Miscellaneous supplies	6,441.01
Office expenses	707 84
Assay office wages	6,966.51
Assay office supplies	3,588.05
Team expense	284 75
Legal expense	3,517.05
Tax on real estate	1,443 05
Tax on proceeds of bullion	3,576.48
Hoisting	15,496.20
Reduction	61 351 20
One-half expense C & C. sh ft	126,200 00
One-half royalty to Sutro Tunnel Co	3,134.00
Interest and exchange	1,373.56
Transportation and hauling	1,455.85
Best & Belcher joint winze	777.35
Suction fans	15,675.41
Samples shipped	258.87
Compressed air	2,069.50
Cash on hand, Dec. 31, 1881	1,980.87
Total	$367,792.98

As to cost of sinking deep shafts on the Comstock, it will be well to note the cost of the C. & C. shaft during the year. This was in January, 1880, about 194 ft. below the 2300-level, and had been sunk (the first of this month) 33 ft. below the 2500 level. A large sump drift has been run out a distance of 50 ft. from the bottom. Stationary double plunger pumps have been put in at the 2400-level and 2500-level, with the necessary balance-bobs and tanks to complete the main pumping system to that level.

To do this work cost $377,200, as will be seen by the following record of disbursements for this shaft for the year:

Office supplies and repairs	$ 1,418 19
Miscellaneous supplies	28,460 38
Candles	5,736 70
Powder, caps and fuse	18,977 50
Timber	19,890 24
Wood	106,671 99
Oils	4,364 08
Ice	24,724 35
Water	9,690 00
Wire cable	2,373 44
Salaries	1,800 00
Wages	112,125 34
Real estate	750 00
Team expense	77 00
Contribution account	90 00
Interest and exchange	333 86
Taxes	4,073 53
Pumping	10,037 50
Surveying	1,800 00
Legal expenses	20,410 50
Transportation and hauling	3,027 10
Balance cash on hand	457 70
Total	$377,200 05

The following, from the White Pine *News*, shows the bullion shipment from Cherry Creek, Nevada, through Wells, Fargo & Co.'s office for the year ending December 31, 1881, the December shipment being pretty closely approximated:

January	$ 23,020
February	33,072
March	23,040
April	39,490
May	41,685
June	39,757
July	32,700
August	27,150
September	25,465
October	21,950
November	31,367
December	33,000
Total	$375,680

Of this amount the Star shipped $363,031 91, the balance coming from the Exchange, Teacup, Silver Canyon, and Schellburn.

The shipments of Tuscarora bullion for the year 1881, as furnished by the books of Wells, Fargo & Co. at that place, are given as follows:

January	$ 25,025 04
February	39,224 76
March	97,590 00
April	31,276 13
May	20,745 43
June	24,028 28
July	16,888 63
August	69,972 90
September	14,091 00
October	9,146 01
November	37,207 14
Total	$387,196 34

With the December shipments already made, and those to come, it is estimated that the amount will reach a total of $422,396.

The Grantsville *Bonanza*, speaking of that section, says: In Nye county the outlook was never more promising. Downeyville has shaken off her letbargy and will again fall into the ranks as a bullion producer. Her mines are improving as work progresses and the ore encountered is of a high grade. Ellsworth, after a sleep of several years, is showing signs of activity, and it is confidently expected that the Esta Buena company will be shipping bullion before the first of June. The prospects of this company are excellent. Operations will also be resumed in the Mount Vernon, a mining property of more than ordinary promise. The now dead camp of Lodi is expected soon to show some signs of vitality, as a valuable mine there will probably pass into the hands of capitalists. Gold Park, the new venture of Messrs. Cooper and San Pedro, contains some of the most promising mines in Nye county. The ores are chiefly gold and are rich. Here in Grantsville things at present are very quiet, but the people are hopeful. The mines are known to be rich in mineral, and the Alexander, at the time of shutting down, never looked better. It is one of the biggest mines in the State, and has produced in the neighborhood of $1,500,000. There are immense quantities of ore in sight, and when operations are resumed a straight shaft will probably be sunk for the more effective working of the mine. There are numerous other mining locations in and around Grantsville that only require capital to develop into valuable properties; in fact, it is acknowledged by all mining men who have visited and examined the mines in this district that there is no richer mineral belt in the State, the ore deposits being simply immense. In Washington and San Juan canyons there are also some valuable mines, and from some of these the ore is being shipped to Salt Lake for reduction. In the mines around Ione nothing is being done at present, but strong hopes are entertained that operations will be resumed in some of them during 1882. In Ophir canyon there are some valuable mines. In Jett canyon there are some promising mines that have never been properly handled. The mines of Jefferson are known to be rich in mineral and have produced considerable bullion, but mismanagement and stock manipulation have operated against them sadly. Some little work is being done in the district, and it would not be at all surprising to see operations resumed in that once flourishing camp before the close of 1882. Nye is one of the richest mineralized counties in Nevada, and all that is required to demonstrate this fact beyond the peradventure of a doubt is capital to operate the closed-down mines and open up properly those that are now being worked.

As we have before stated, it would be impossible for us to itemize all the news of interest in various parts of Nevada. Our "Mining Summary" has given each week the correct news of the districts. The Carson and Colorado railroad is going to open up a considerable mineral country. Esmeralda district, with its many mines, has not made a very great showing this year, but this is more owing to the lack of capital for development than the poverty of the mines themselves. Many other districts in the State are in the same straits, and Nevada will not be likely to get any very great "boom" until a bonanza in the Comstock again draws attention that way, and men begin to look after the other promising districts.

Colorado.

Colorado ranks all the States and Territories this year as a bullion producer. The Denver *Tribune* presents a statement of the bullion product of Colorado by counties for the year 1881, showing a grand total of $22,680,900, an increase of $859,000 over 1880. Lake county, in which the famous Leadville district is located, is credited with $13,502,000 by that paper, while Clear Lake county is credited with $2,-205,000, Gilpin county $2,150,700, and Summit county $1,820,000. Fourteen other counties figure in the list, the three most noteworthy being Bowlder, Custer and Gunnison, the aggregate yield of which was $1,679,300, about equally divided. The product of Leadville is given by the Leadville *Herald* at $13,170,600, in quarterly statements, as follows:

First quarter	$ 3,097,800
Second quarter	3,404,000
Third quarter	3,170,300
Fourth quarter	3,498,500
Total	$13,170,600

The sources of the value for each quarter are given. The Leadville *Democrat* puts the same information in a different form, by not only giving the sources of the bullion, but the number of mines from which it was taken and the descriptions. The total coin value of the product of 131 Leadville mines is given by the *Democrat* at $13,100,800. The difference between this and the *Herald* total is not of much importance, but there is a wide variation in the details. The yield of metal was 11,135 ounces gold, 7,174,234 ounces silver and 74,409,217 lbs. lead. Last year the *Democrat* reported the coin value of the gold, silver and lead produced by the Leadville mines at $15,095,200. The decrease of $2,000,000 for the past year is not encouraging. The yield of the Leadville camp has been remarkable. The total for the past five years has been as follows:

In 1877	$ 555,300
In 1878	3,152,900
In 1879	10,189,500
In 1880	15,095,200
In 1881	13,100,800
Total	$42,093,700

The camp has only come into prominence during the past four years. Up to the close of 1876 the total yield has only been a little over $6,-000,000. The product for the past two years has exceeded that of any other mining camp in the whole country.

The list by counties is as follows:

County.	Total.
Bowlder	$335,482.83
Chaffee	100,000.00
Clear Creek	2,204,980.00
Custer	608,519.37
Dolores	125,000.00
Fremont	14,536.50
Gilpin	2,165,760.00
Grand	10,000.00
Gunnison	535,033.00
Hinsdale	187,375.00
Lake	13,502,029.00
La Plata and San Juan	40,000.00
Ouray	78,000.00
Park	350,000.00
Pitkin	120,000.00
Rio Grande	251,000.00
Saguache	40,000.00
Summit	1,828,000.00
Grand Total	$22,680,685.00

It is as well to state that these figures include gold, silver, copper and lead.

The Georgetown *Courier* has been furnished with the following statements of the 1881 business from Colorado smelting works:

BOSTON AND COLORADO WORKS, ARGO.

Counties.	Gold.	Silver.	Copper.	Total.
Gilpin	$398,000	$ 76 000	$ 89,000	$ 563,000
Clear Creek	20,000	518,000	13,000	560,000
Bowlder	48 000	23,000	1,000	72,000
Park	3,000	125,000	3,000	134,000
Lake	.....	220,000	.....	220,000
Chaffee & Gun	.....	72,000	5,000	77,000
Summit	.....	728,000	.....	728,000
Custer	63,000	10 000	.....	79,000
San Juan	4,000	33,000	.....	37,000
Montana	11,000	388,00	174,000	573,000
New Mexico	.....	.....	.....	.....
Utah, etc	12,000	14,000	12 000	38,000
Total	$568,000	$2,216,000	$297,000	$3,081,000

MOORE MINING AND SMELTING CO., GOLDEN.

County.	Tons	Ozs. Gold	Ozs. Silver.	Value.
Gilpin	3,906	5,739	50,250	$183,377
Clear Creek	2,900	168	327,215	463 713
Lake	.....	414	21,654	26,956
Other sources	902	.....	52,302	64 456
Total	1,122	5,907	460,421	$678,505

GOLDEN SMELTING COMPANY

County.	Gold.	Silver.	Lead.	Totals.
Gilpin	$144,016.13	$258,724.74	$ 8,282 96	$210,823.83
Clear Creek	551.06	184,686.90	29,571 52	214,809.54
Bowlder	35,421.99	43,487.37	.....	78,909.33
Lake	.....	38,326.59	15,981 36	54,307.95
Summit	.....	34,423.70	7,920.44	42,353.14
Custer	.....	26,868.80	33,513 02	60,381.82
Oth'r source	449.36	2,088.98	782 40	3,320.74
				$604,906.35

Total No. of tons, 8,081.
Tons bought in 1880—5,012; value, $586,044.26.
Tons bought in 1879—3,006; value, $310,962 09.

The following table represents the amount of ore purchased by the Miners' Smelting and Reduction Co. since commencing business in May last. In a few weeks their furnace capacity at Golden will be doubled, and in consequence ore purchases will increase in proportion:

County.	Gold.	Silver.	Copper.	Total.
Gilpin	$ 58,833.61	$ 11,734.00	$7,063 00	$ 78,230.61
Clear Creek	35,305.00	184 000 85	11,000.00	230,911.85
Oth'r source	6,159.00	7,100.00	12,433.00	25,695.00
Totals	$100,297.61	$202,840.85	$31,690.00	$334,837.46

According to the figures given above of bullion production by counties the total is $500,000 short of last year. Lake falls short $1,500,000; Clear Creek, $800,000; Gilpio, $500,000; Bowlder, 250,000; Custer, $200 000, and Park $50,000. Summit has gained $1 400 000; Gunnison and Pitkin, $900,000; Chaffee, $50,000, and the San Juan country, $700,000. The total output of the mines falls short of expectations, yet the results are very satisfactory. A number of the once heavy producing mines of Lake, Gilpin and some other counties have taken out very little ore for various reasons.

From a comprehensive article in the *Rocky Mountain Mining Review* we condense the following facts, which summarize the condition of the mining industry in the counties of the State:

The mining interests of Clear Creek county have continued about the same during the past year as for 1880. More successful work has been done in the vicinity of Idaho springs than heretofore, and the production in that quarter is larger than heretofore. The mines about Georgetown are not, as a rule, doing as well as formerly. The output of Clear Creek county will be about $2,800,000.

Gilpin county is the old reliable gold-producing county of the State. Notwithstanding the fact that several of the mines worked in past years most successfully have been practically idle, and that work has been pushed for development only, the total output will be fully as large as for 1880, and possibly exceed it by a few thousand dollars.

Bowlder county has suffered during the past year to some extent a sort of reaction from her early boom. There are many good properties in this county, and some of them have been developed to a considerable extent. The output will be about $533,500.

In Lake county—Notwithstanding all that has been said about the mines of Leadville playing out, that camp still remains the leading producer in the State, and in all probability will retain that position for many years to come. The output of the Leadville mines for the past year, as nearly as can be ascertained, is $11,000,000. Several of the more extensive mines have been practically idle during most of the year, some of which it is now believed will resume work on an extensive scale early in the present year. There are many comparatively newly-discovered mines in the vicinity of Leadville that promise to become producers at an early date, and in fact that camp is the center of the richest mining country in the world.

In Summit county the Ten-Mile district has produced largely during the past year, and will probably continue to take out about the usual quantity of pay, even though the celebrated Robinson should prove a failure. This section is rich in mineral.

The balance of the county which added little to the output during 1880, is coming to the front with rich discoveries in all directions, and promises to become one of the best mining sections in the State. The production of Summity Co. will probably reach nearly $3,000,000.

Park county is coming into prominence with quite a boom. Many good mines have been discovered and worked within the past year; two smelters have been built, and abundance of capital has found its way into that section to work the mines successfully during the coming year.

Gunnison county has all the prospects of becoming at no distant date one of the best producing counties in the State, but at present her mines are mostly in the prospect condition. We estimate her product for the year at $150,000.

Dolores, the new county, has many good properties and some of extraordinary richness. Through lack of facilities for treatment and the great expense and difficulty of shipment, the output will be small.

Chaffee county, comprising within its boundaries 1,189 square miles, with a population of 10,000, has much good mining country and a great deal of work done in the way of development. The output for 1881 will be about $150,000.

Ouray county has suffered with the balance of the San Juan through lack of means for treating its ores. We give the output for 1881 at $80,000.

Custer county has taken out more ore than last year, and the mines are in better condition. We estimate the output at $1,500,000.

Saguache county has a number of valuable mines, but development work is just fairly beginning, and the cost of shipment is so great that the output will not exceed $62,000 for 1881.

Rio Grande county will output about $385,000 for the year. The mines are good, but work is needed upon them, and facilities for treatment are lacking.

Hinsdale county. The mines here also are comparatively new though they give promise of great richness. The output will be $125,000.

Oregon.

The State of Oregon is credited this year with a yield of $1,189,615, all of which was gold, except $48,684. Oregon, in 1880, produced $1,059,644, so that this last year its production shows an increase which, though not very much, is satisfactory, as proving that recent developments in different parts of the State have been profitable.

Eastern Oregon is just in a transition stage from a placer mining section to a quartz producing region. It comprises, says the *Oregonian*, the five counties of Union, Grant, Baker and Wasco, all containing quartz ledges of various importance, and Umatilla, which has no mining except the Chinese rocker claims along the Columbia. Baker county has produced the largest value of bullion; Grant next, while Union and Wasco are known to have ledges of argentiferous galena, which have not yet been sufficiently developed to determine their value. Those of Union lie in the Eagle Creek range, which divides Wallowa valley from that of the Grande Ronde, while those of Wasco are on the headwaters of the Ochoco. Baker county has placer gold diggings on Burnt and Powder rivers and their tributaries, chief among which is Auburn creek, which at one time gave employment to over 2,000 miners. Strange to say, no quartz ledges of any width or specific value have been discovered on the headwaters of that stream. On Burnt river, about 30 miles from Baker City, is a new ledge, owned by Capt. J. C. Ainsworth, of Oakland, Cal., and Theodore Wygant and Capt. Joseph Myrick, of Portland, the latter gentleman being Superintendent. The Connor Creek mine is located on that stream, about 50 miles from Baker City, and is owned by S. G. Reed and John Faull, the latter being Superintendent. It is beyond doubt the best quartz ledge in the State, and is currently reported to have cleared $140,000 over all expenses in 1878.

The celebrated Virtue mine, formerly called the Rockfellow, is also located in Baker county, but has produced no bullion for several years, and its shafts are full of water. It has always been an expensive mine to run for that reason. The Rye Valley mine, at one time owned by Fiske & Thielsen, of this city, but now the property of a Boston company, is under the supervision of J. D. Locke, but we have no data of its output. Grant county contains a greater diversity of valuable minerals than any other county in the State, though the production of bullion is below that of Baker. The chief placer mines are on Canyon and Prairie creeks, both of which have paid enormously in the past 20 years. These diggings were struck by a party of prospectors from Yreka, Cal., who were bound to Boise Basin. Two or three of the wealthiest firms in San Francisco got their start in Canyon City, the diggings of which extend a distance of two miles down to John Day town. Every foot of this ground has paid enormously, and some of it has been worked half a dozen times over. Near Prairie City, on the opposite side of the John Day valley, irregular bodies of auriferous quartz have been found, easy to work and free from rebellious sulphurets. Over on Granite creek are several small ledges of antimonial silver, the best of which is the "Beagle," situated about three miles from the "Monumental," famed for its dividends of the Fenian persuasion. All this rock is cased in granite, which does not speak well for its durability, but the grade of ore is very high. Down in the John Day river, below the South Fork, are deposits of red manganese, which is used in the manufacture of gold and silver ware as a polishing agent. Carbonates of lead, carrying a small portion of silver, are also found in the extreme north end of the county, but no thoroughly developed ledge as yet exists—hence it is hardly fair to give this branch of mining any more than a passing mention. Small deposits of cinnabar have been found in the southern end of the county.

Southern Oregon Mines.

In southern Oregon mining is the great special industry. All the mines operated in Jackson county are placers, and at this season present the unsightly appearance of scare upon the country, very much resembling abandoned brickyards. There are several fine quartz ledges in the county, but to operate them mills must be employed, and none have yet been put in. Just what the annual yield of the mines here is, it is impossible to say. The dust is used as a circulating medium among the miners, part of it is sold at the Jacksonville bank, part is traded at the stores, part is shipped by registered package, part is shipped by express, and part is carried out by the miners themselves. The difficulties of the situation may be seen. Only in a general way we may say that the annual gold production of the county approaches half a million dollars, much of which finds its way into the hands of farmers and merchants of the county. Fully one-half of the men engaged in mining are Chinese, and one of the principal mining bosses and proprietors is a Chinaman. The mining season commences in November or December, with the winter rains, and lasts till May, the miners generally making enough during these months to keep them the rest of the year. Every process of water mining, from the old-fashioned rocker to the most approved hydraulic methods, are employed in these mines.

Mining is the great and almost the only industry of Josephine county. They are similar to the mines of Jackson. The annual gold production of the various districts in Josephine is estimated at $192,500.

The number of men engaged in these diggings is about five hundred, more than 250 being Chinamen. The various hydraulic methods are in use. The mines of Douglas county are mostly quartz, and are undeveloped. Very rich silver ore is found in several places, whose owners would like to sell.

For more than thirty years black sand mining has been carried on along the beach south of Coos Bay. The Lane mine was first worked sixteen years ago, and is now under the management of Mr. Baily, to whom it is leased. The works represent an investment of $25,000, and employ sixteen men. The Eagle company spent $50,000 in building works, etc., and after conducting a failing business for some time, sold out for $40,000 to a California company, who spent $25,000 more and then abandoned the claim. First and last a good deal of gold was taken out of the Eagle, but the business never was profitable. Miners working by hand along the beach have always made good wages, and some few have picked up fortunes. "Big Mac" took $100,000 out of the sand in a few weeks, spent it in a few months, and is now keeping a hotel in Crescent City. The town of Randolph, which is marked on the maps, exists nowhere else. It was once a thriving mining camp, but the sands shifted, the mines failed and Randolph died—died as only a mining town can die.

Arizona.

In the MINING AND SCIENTIFIC PRESS of the 17th ult., we gave a very full statement of mining affairs in Arizona. In that issue we gave a resume of what was going on in the mines there, a list of the mining districts, yield of prominent mines, descriptions of the country, etc. Having done this such a short time since, it is not necessary in this review to do more than add something to what has heretofore been said. Those of our readers who desire general information concerning the Territory, will do well to send for the number of the PRESS referred to.

The Territory has had a year of unprecedented prosperity, and we feel certain, it is only the first one of many to come. For years and years Arizona has been in the background through lack of facilities for transportation, which now being furnished, enables her to mine as other regions mine and not be kept stationary on account of her isolation. The output of ore has produced an amount of bullion which raises the Territory to fourth in the order of bullion production. It now ranks next to Nevada, with a strong probability that, with the opening up of many of its yet undeveloped districts it will attain a higher place in the scale.

The general product for the year we give in a table in the previous part of this article. The Yuma *Sentinel* of the 21st inst., speaking of bullion product, says: Accordingly, from her small output of less than $400,000 of gold and silver in 1875, its yearly output has been steadily augmenting, until it has reached, in 1881, over $9,000,000. The output for 1880, up to June 30th, was $2,400,000, of which $2,000,000 was silver. The gain from this last date to June 30, 1881, was $5,950,823, of which $5,796,306 was silver. These amounts are the authorized estimates, which, of course, do not include segregated small amounts not statistically reported. From no stamp mill in 1868, the increase has been to 55, of from 1 to 100 stamps each, aggregating 785 stamps, besides some 10 others that are now being put up.

The Arizona *Star*, in summing up the bullion product, says: The output of precious metals last year from Arizona did not exceed $4,000,000. For the year 1881, so far as heard from, the output has been $9,101,179.06. This does not include the output north of the Tiptop mine, nor that of the 80-stamp mill of the Vulture; nor Silver King concentrations, and the large quantity of high-grade ores shipped out of the Territory, all of which will, at a conservative estimate, add at least $1,000,000 to the total amount.

Tabulated, we give the following results:

Tombstone	$5,142,125.53
Silver King	1,800,000.00
Harshaw Co.	779,500.0
Ore from Harshaw District	46,000.0
Yuma and Mohave gold	64,000.0
" " silver	103,230.00
Tiptop	298,512.32
Dos Cabezas	27,862.81
Globe District, via Casa Grande	725,000.00
Total product of Pima county gold dust	40,159.00
Silver bullion, Pima	51,516.00
Galeyville	15,500.00
Making a total of	$9,101,179.66
To which add the value of copper	1,563,011.40
And from all other sources	1,000,000.00
And we have a total of	$11,664,191.00

Which, to say the least, is within bounds.

The total product of Harshaw Co.	$1,155,154.00
Total of Tiptop	1,212,022.60

TOMBSTONE MINES.

T. M. & M. Co.	$2,704,936.00
Contention	2,703,144.39
Grand Central	1,050,875.30
Head Center	191,520.00
Vizina	526,716.00
Corbin Mill	40,000.00
Ingersoll	15,000.00
Sunset	15,000.00
Boston Mill	112,007.83
Total for Tombstone, since discovery of district.	$7,359,200.83

DIVIDENDS.

T. M. & M. Co.	$1,100,000.00
Contention	1,375,000.00
Grand Central	650,000.00
Vizina	80,000.00
Total dividends	$3,155,000.00

The most prominent camp in Arizona is Tombstone, and this has produced the largest supply of bullion. The record of the district from the dropping of the first stamp in June, 1879, to Jan. 1, 1882, is given by the *Epitaph* as follows:

TOMBSTONE M. AND M. CO.

Total to Nov. 1, 1881	$2,482,843.60
For November	112,032.73
For December	130,000.00
Total	$2,704,936.33
Dividends	1,100,000.00

WESTERN (NOW CONTENTION).

Total to Nov. 1	$2,437,144.39
For November	130,000.00
For December	136,000.00
Total	$2,703,144.39
Dividends	1,375,000.00

GRAND CENTRAL.

To Nov. 1	$848,176.46
For November	97,698.84
For December	105,000.00
Total	$1,050,875.30
Dividends	$300,000.00
Repayment original outlay	300,000.00
Total	$600,000.00

VIZINA.

To Nov. 1	$424,693.00
For November	57,023.00
For December	45,000.00
Total	$526,716.98
Dividends	60,000.00

HEAD CENTER.

To Nov. 1st	$156,520.52
For November	20,000.00
For December	15,000.00
Total	$191,520.52

SUNDRIES.

Corbin Mill	$40,000.00
Ingersoll	15,000.00
Sunset	15,000.00
Total	$70,000.00

BOSTON MILL.

To Dec. 1st	$112,007.31

The Boston mill has been reduced all the ore of the Vizina Co.; therefore, the actual production of the mill has been $638,724.29.

RECAPITULATION.

Tombstone M. & M. Co.	$2,704,936.33
Western (Contention)	2,703,144.39
Grand Central	1,050,875.30
Vizina	526,716.98
Head Center	191,520.52
Boston Mill	112,724.29
Corbin Mill	40,000.00
Ingersoll	15,000.00
Sunset	15,000.00
Total	$7,359,917.81

DIVIDENDS.

Tombstone M. & M. Co.	$1,100,000.00
Western (Contention)	1,375,000.00
Grand Central—repayment	300,000.00
Grand Central—dividends	300,000.00
Vizina	60,000.00
Total	$3,135,000.00

To show the yield per ton, etc., and yield of ore from two or three prominent mines, we give the following:

The Contention Con. property from March 8, 1880, to Dec. 31, 1881, produced bullion to the value of $2,678,327, and paid dividends to the amount of $1,475,000, and all resulting from a total ore product of 38,720 tons, which is a trifle over the rate of $59 per ton.

The Grand Central ore output for the eight months and thirteen days of 1881 foots up in total of 22,115 tons, and from its reduction resulted $1,061,875, being at the rate of $48 per ton. Its declared dividends foot up $300,000, besides the $300,000 refunded to those who advanced them for the construction of the mill and hoisting works and the opening of the mine, making thus $600,000 in all paid by this very profitable mining venture.

The Head Center mine, from April 15, 1881, to Dec. 31, 1881, yielded 7,450 tons of ore, from the reduction of which resulted $206,853, being at the rate of $27.66 per ton.

The Virginia Con. Co., up to the 1st instant, produced 5,887 tons of ore and shipped $547,886, in bullion as the result, giving at the rate of $93 per ton.

Pima county contains some of the finest mining properties in the Territory, but we have not space to detail every district. The *Citizen* summarizes as follows:

From the west, begins the great Meyers District, whose ores are rich and plentiful, and where a large city must soon rear its head.

To the south are the districts of Tyndall, full of riches; the Wrightson, equally as rich; Oro Blanco, Arivaca, Greaterville, Helvetia and Empire. In the last-named district the famous Total Wreck mine is located, which promises to startle the world with its output. The Old Hat district to the east is full of great promise, and the ledges there being developed are not a whit behind the best in the Territory. Even in the Tucson range, to the west of the city, the precious metals are found in great abundance, and of no mean character. The time will come when the Santa Cruz will be lined with mills and smelters.

Pioneer district, where the famous Silver King is, demands more than passing notice. Pinal *Drill* says: Pioneer district stands preeminent to-day in our young Territory. We have risen, within the last couple of years, from a perfect *terra incognita* to a shining mark amongst our sister districts. Pioneer district is the first bullion-producing district in the Territory. Universal industry and order prevail. The gambling, wild, reckless excitements of a mining mania do not exist amongst us. With us, mining is a sober, steady business, and no farming community in the country is more free from crime and misdeeds. Solid, substantial development, regular and permanent production and profit, mark the onward progress of Pinal. We can scarcely point to a single undertaking that has failed. Some of them may have had their drawbacks, but they have been overcome. Amongst all stands the king of mines, well named. The industry of this mining enterprise alone scatters amongst its workmen and employees about a thousand dollars daily, and any community that can put a hand into such a pocket, and draw out a thousand dollars every day, for work alone, may be considered wealthy. Still, that is but one item. The Silver Queen, the Mount View, the Wide Awake, the Pinal Con., the Eastland, the North King, the Oxford and Dover, the Lewis, the Goodenough the Specie Paying, the Arizona and Massachusetts, the Hudson and the Hastings Con., are all of them incorporated. Companies, working with Eastern and Western capital, represented here by able superintendents and skilful miners, advancing in the development of their properties with greater or less actual result, according to the progress they have made, and the capital employed in the brief space of their existence. Besides these incorporations, individual owners of mines have, within 1881, expended large sums of money, and done much work. Without singling out any of them, we might name them by the hundred. The contiguous camps of Mineral Hill, Belle Air, Silver King, Queen Creek, Mineral Creek, Happy Camp, Peachville, Rogers, Cole and Randolph districts, all centering at Pinal, are of immense value. All the precious metals abound to a certainty, and we have yet to record a single instance, in which even mere prospects have not shown increased value at greater depth,

As we bsfore statsd, it bsing so lately that we gave a complets review of Arizona's mining prospects, it is hardly worth while, after so short a time has elapsed, to go over the ground again. We do not fail to mention other mines and districts from want of knowledge of their existsnce or merits, but simply for the reason given. It will not do to close this comparatively brief notice of Arizona without referring to the great advantage it hae derived from the Southern Pacific railroad. That road has hronght prosperity to the whole region. It has hrought immigrants, huilt up towne and civilized the region, so to epeak. Its managers seem to have felt a consciousness that Arizona's interests were identical with theirs, and they have taken great pains to disseminate information concerning the regions traversed hy their road.

New Mexico.

New Mexico is creditedhy Wells, Fargo & Co. with a production of $814,944 for the year 1881. The year before it produced $711,300. So an increase is noted, though but a small one. The country is hadly in need of capital to develop its mines, hut now that the railroad has come through, capital is heing attracted in that direction, so it will not he long before mining development will he greatly advanced.

Very little has heen done in the way of devoloping the eection's mineralogical resources, as may he seen from the following tahle, which affords a close estimate of the yield since New Mexico became a portion of the territory of the United States:

1848 to 1808	$2,500,000
1808	250,000
1809	500,000
1870	500,000
1871	500,000
1872	600,000
1873	600 000
1874	300,000
1875	325,000
1875 to 1880	2,200,000
1880	711,300
1881	814,944
Total	$9,601,244

It has heen very difficult to get correct statistics of production of New Mexico. Even as late ae 1880, there is a great difference in the eetimate of production made by Wells, Fargo & Co. and the director of the mint. The latter puts the product for calendar year 1880 at $555,000, of which $425,000 is eilver. Wells, Fargo & Co. fix the figures at $711,300.

The readiness with which capital is taking bold of the mines of New Mexico is very encouraging, and one year more will make wonderful progress in this respect. Long neglected hy capital thers are now many opportunities for its investment, and many ehrewd operators are taking advantage of them.

New Mexico expecte before long to exceed all other regions as a copper-producing country. The New Mexico *Mining World* says:

An investigation of the copper resources of New Mexico lsads to the helief that the depreciation in the value of copper, which will follow in the development of New Mexican mines, will practically exclude the other mines in the United States, if not, indeed, the most of those in the world, from competing with the Territory. One of the richest deposits is at Clifton, 93 miles almost due west from Silver City, and hetween 60 and 65 miles from Coronada. The ore seems almost unlimited in qnantity—in fact there is a solid mountain of copper. To prove this, the first development was hy tunnel at the hase, and from which drifts were carried in all directions, shafts in themeantimeheingsunk from ahove, the ores from the top showing fully as rich as those at the hottom.

The same journal thus eummarizes the eituation at present: The era of prospecting having past, and the day of metal producing hsing already well hsgun, the coming year will he one in which a vast amount of capital will find its proper plaes in the milling and reduction of the vast etores of ore that are opened to inspection in almost every mountain range. In hundreds of districts the rich mineral ie lying on the dumps awaiting a purchaser.

In Silver City, Grant county, there are four stamp mills and two smelters now in operation. At the Lake valley mines a $100,000 plant for reducing the vast qnantities of ores of the Philadelphia companies is to he erscted.

At Socorro the Torrence stamp mill is now in operation. The mine has nearly 700 ft. of levels and 430 ft. of shafts, with mammoth bodies of free milling ore in sight. The La Joya and New Orleans emelter at thie point is completed and has made several successful runs of ore from the adjacsnt districts already.

The Loe Cerillos Rsduction and Milling Co. are huying ores with great diligence in all parts of the Territory, especially in the Magdalenas, where their agent is daily making contracts. In the Cerillos, the Duryea furnace and other reduction works are almost ready to turn out hullion. White Oake has a 10-stamp mill, and the Homestake company have a large plant on the ground, to he erected and working in a few weeks.

The San Pedro and Canyon del Aqua companiee, in the placers, are doing a great deal of work, and will douhtless ship a large amount of hullion in the coming year.

Besides these, there are scores of instances where all the preliminary arrangements have been made to erect mille and reduction works; we speak only of the facts as accomplished. A large interest is shown in a proposition to huild reduction works at Mineral hill, near this city, and we have no douht that the movement will result as its promoters desire. The hullion output of 1882 will not fall anything short of $2,000,000.

The Black range is a section which has attracted great attention. The Black range is eituated in Socorro connty, in the eouthwestern part of the Territory, and constitutes a portion of the main Rocky monntain chain, dividing the drainage of the Cuchilla, Negra and Gila rivers. The more elevated portion is densely timbered with pine and juniper, and pressnts in the distance that somher appearance, which first suggests the name. The most important mines are on the eastern slope of the mountains, or Wild Horse, Turkey, Dry, Mineral and Chloride gulches. The district is 65 milee from San Marcial, on the Atchinson, Topeka and Santa Fe railroad.

Los Cerrillos form a small group of mountains ahout eighteen miles southwest of Santa Fe. That gold existed in these monntains was known to the first Americane who came many years ago to the New Mexican capital. Those Americane who leaped so far into the almost undiscovered country as to settle in Santa Fe, were amassing great fortunes in the mercantile and trading hnsinese, which they established; there was no necessity in their case for proepecting and epecnlation, hence there was no mining done until, with the advent of railroad communication, came thousands of minere and adventurere seeking fortunes in other ways than post-trading. A railroad station was made on the A. T. & S. F. line at the base of the Cerrillos, and a town laid out which hears the name of tbe mountains. The Galisteo creek divides the town site and flows west and south in the basin which lies hetween Los Cerrillos and Placer mountains. The mining camps of Carhonateville, Bonanza City, and Hungry Gulch have sprnng into existence as supply points for thoee engaged in the minee in the immediate vicinity. Horn, ruby, native and wire silver, wire gold, and silver glance have bsen found in several places, while the ores are of the several general kinds of white quartz, iron stained, decomposed; spar and galena carhonate of coppsr and gray coppsr with chlorides and bromides frequently.

In the issue of the MINING AND SCIENTIFIC PRESS of Decsmber 17th, we gave a great deal of space to New Mexican interests, giving an account of the various mining districts, etc. The reader is referred to that issue for much interesting matter in thie connection.

Utah.

Utah Territory makee tbis year a good showing in its hullion product, having turned out $7,311,288 as against $6,450,953, in 1880. The following tahle we take from the Salt Lake *Tribune*, which issued on the let of the month a most magnificent numher, oontaining a mass of information ahout the mines, etc., which must satisfy the most eager inquirer:

WELLS, FARGO & Co.'s STATEMENT OF THE MINERAL PRODUCT OF UTAH FOR 1881.

BASE BULLION.	Lbs. Lead Ref'd.	Lbs. Lead Unref'd.	Ozs. Silver.	Ozs. Gold.
Frisco M. & S. Co.	.....	3,023,213	221,846	425
Germania S. & R. Works.	2,615,373	3,687,284	234,260	191
Hanauer	.....	3,015,228	176,320	438
Horn Silver Mining Co.	.....	16,343,995	1,259,903	.....
Mingo Furnace Co.	.....	11,977,649	437,176	832
Other Smelters	.....	1,634,697	56,680	215
	2,615,373	39,681,966	2,386,185	2,101
Deduct Base Bullion purchased for Germania Refining Works	.....	385,305	18,427	39
Net Product Base Bullion	.....	39,296,601	2,367,758	2,062
Lead, Silver and Gold in Ores Shipped	.....	2,895,026	276,141	560
Total Ref'd Lead, Ores and Base Bullion	2,615,373	42,191,627	2,643,899	2,622

DORE BARS.	OZS. SILVER.	OZS. GOLD
Germania Refining Works	115,219	317
Ontario Silver Mining Co.	1,909,870	.....
Silver Reef Mills	614,368	.....
Tintic M. & M. Co.	73,031	406
Other Mills and Placers	43,804	4,613
Total Dore Bars	2,756,292	5,336

RECAPITULATION.

2,645,373 lbs. Refined Lead, at 5½ per lb.	$ 145,495 51
42,191,625 lbs. Unrefined Lead, at $50 per ton	1,054,790 67
5,400,191 ozs. Silver, at $1.11	5,994,212 01
7,958 ozs. Gold, at $20	159,160 00
Total Export Value	$7,353,658 19

The above includes the oree received from Idaho, Montana and Nevada, aggregating 3,969,440 lbs. lead, 441,846 ozs. of silver, and 976 ozs. of gold. Computing the gold and silver at the Mint valuation, and lead at its value at the eeaboard, it wonld increase the value of the product to $9,401,475.56.

It is impossible in tbe space we have to give even a glance at the various districts, hut must refer the reader to the holiday numher of the *Tribune*. Still a comparison hetween some of the items of the report given ahove, will he of intereet as showing the gains in some of the hullion makers.

The Ontario mine produesd the past year 1,909,870 ozs. silver; in 1880 it produced 1,439,542, an increase of 470,228 ozs., or $521,953.08. A gross production for this mine of $2,119,955.70 during the year 1881 is considerably in excess of the yield of any other single concern. Its yield, moreover, is pure silver.

The great Horn Silver comes next in volume of production. In 1881 it produced 16,343,995 lbs. of lsad, and 1,259,903 ozs. of silver, or a total export value of $408,600 for lead, and $1,398,492.33 for silver, an aggregate production of $1,807,092.33. This is an increase in valuation of $942,290.93 over 1880, or more than 100%. It is proper to state here that in all these reckonings the value of lead is computed at $50 per ton for eaoh year, hut the value of silver was computed at $1.10 in 1880, and $1.11 in 1881.

Ths Gsrmania smelter has made a rsmarkahle increase. Its production of unrefined lead rose from 1,722,865 lbs. in 1880, to 3,687,284 lbs. in 1881; of silver, from 162,909 ozs. to 234,260 ozs., and of Dore hars from 36,422 ozs. to 115,219 ozs. Its production of refined lead fell from 2,892,498 lbs. in 1880, to 2,645,373 lbs. in 1881. Ite production for 1881 represente a value of $145,495.51 of refined lead, $92,200 of unrefined lead, $260,028.60 of eilver, and $127,893.09 of Dore hare—an aggregate production the past year to the volume of $725,617.20, against $364,394.80 in 1880, heing very close to an increase of 100%.

Tbe Mingo smelter made also a snrprieing gain. It produced 11,977,649 lbs. of lead and 437,176 ozs. of silver in 1881, as against 6,464,382 lbs. of lead and 272,832 ozs. of eilver in 1880. The export valne of the product of 1881 is $784,705.36, againet a value of $461,715.20 in 1880. The Mingo smelter is the only one which shows an increased gold product in 1881 over 1880. For 1881 it produced 832 ozs. of gold as againet 675 the year hefore.

The Frisco smelter produced 3,023,213 lbs. of lead in 1881, and 221,846 ozs. of silver, against 2,017,991 lbs. of lead and 125,722 ozs. of eilver in 1880. Valne of product in 1881, $321,799.06; valne in 1880, $190,570.20.

The Hananer smelter (last year Morgan smelter) produced in 1881, 3,015,229 lbs. of lead and 176,320 ozs. of silver, as against 2,733,782 lbs. of lead in 1880, and 157,374 ozs. of silver. Value of the product of 1881, $271,095.20; in 1880, $236,451.40.

The most remarkahle increase in any one item is in that of "lead, silver and gold in ores ehipped," which jumped from 831,600 lbs. lead, 24,024 ozs. silver and 23 ozs. gold to 2,895,026 lbs. lead, 276,141 ozs. silver and 560 ozs. gold.

The Silver Reef mines fell off in prodnction on account of the etrike, which caused a long torpor in the Stormont, and psrhaps from other causes, from 846,062 ozs. silver in 1880, to 614,368 ozs. in 1881.

The Tintic M. & M. Co. made a handsome increase, from 41,923 ozs. silver in 1880 to 73,031 ozs. in 1881.

Montana.

Montana stands credited for the past year with a total yield of $4,359,071, against $3,822,379 in 1880. This increase ie mainly from the large and growing camp of Butte, the hullion output of which, as shown hy the hooks of the Pacific Express Co., for the year 1881, was as follows:

	Weight.	Value.
January	8,441	$ 71,535.82
February	11,253	112,400.35
March	13,036	131,453.01
April	12,835	124,292.24
May	11,738	105,599.47
June	10,409	93,933.93
July	9,573	86,613.41
August	13,556	122,985.17
Septemb r	9,015	78,520.11
October	11,035	94,239.28
November	9,951	82,491.13
December	10,641	94,050.14
	131,787	$1,229,180.06

To this amount, says the *Miner*, must be added $500,000, which was shipped through other sources. The output of the smelters is not given in the ahove table. We have no data upon which to hase ite value, hnt it is reasonahle to suppose that it will hring the grand total up to $3,000,000, as the product of the mines of Butte for the year 1881.

The following is a list of tbe mills, smelters and arastras in Butte and vicinity:

Alice—new mill	60 stamps
Alice—o.d mill	20 "
Moulton	40 "
Silver Bow	30 "
Dexter	15 "
Lexington	10 "
Centennial	10 "
Gagnon	10 "
Burlington	10 "
Clipper	10 "
Grove Gulch	6 "
McMinn's	1 "
Total	221 stamps

SMELTERS.	Capacity.
Montana Copper Co	50 tons
Colorado and Montana	40 "
Parrot	80 "
Bell	50 "
Total daily capacity	220 tons

ARASTRAS.

Suprenant's — Smith & Kessler's

Three million, five hnndred thousand pounds of ore and matte, and 2,000,000 ponnds of bullion were ehipped ont of Montana during the year 1881 hy the Utah & Northern railway.

The following tahle shows the value of gold and silver bullion deposited at the U. S. Assay Office, Helena, Montana, during the year ending Dec. 31st, 1881.

	GOLD.	SILVER.
January	$ 28,093 05	$ 4,364 86
February	23,354 68	3,878 04
March	19,733 12	10,895 11
April	22,844 93	14,348 24
May	41,614 17	4,715 29
June	61,301 02	3,427 00
July	104,792 02	10,685 02
August	63,654 69	6,443 87
September	64,732 69	4,190 47
October	63,828 28	9,310 32
November	59,623 23	13,956 23
December (est.)	17,000 00	13,000 00
Total	$670,636 08	$98,714 04

SUMMARY.

Year ending Dec. 31st	GOLD.	SILVER.
1877	$379,481 18	$241,197 12
1878	298,681 77	404,567 98
1879	512,809 16	175,782 93
1880	495,155 19	97,924 60
1881	670,636 03	98,714 04
Total	$2,260,668 92	$1,018,130 67

There is shown a very great discrepancy in the figures of production from hsre. The *Inter-Mountain* givss the following:

The total amount of silver, copper and gold product in the Butte district in 1880 reached $1,428,088 26. An intelligent idea of the rapid rate at which tbe mining industry of the Butte district has increassd since that time can he ohtained from the following table of production during the year 1881:

Alice Company	$1,120,937 60
Montana Copper Company	1,042,640 00
Colorado Company	864,000 00
Silver Bow Company	600,000 00
Lexington Mill	147,000 00
Dexter Mill	70,208 00
Centennial & Clipper (estimated)	25,000 00
Copper ore shipped	197,000 00
Gold shipped through banks	102,280 20
Total	$4,075,160 70

To this amount should he added the value of 5,000 tons of copper-silver ore extracted during the year and now at the Colorado smelter awaiting reduction. Estimating the value of thie ore at an exceedingly low figure—say $55 per ton—we have $275,000 as its cash valuation. At the Alice mine is an extractod reserve of 4,000 tons, which, at $40 per ton, is worth $160,000. On many other mines of the district many hundreds of tons of high and low grade ore have accumulated, and the moet conservative statistician would not estimate the value of tbe unworkcd ore extracted during the past year at less than $600,000, which added to the above tahulated statement of silver-copper matte and gold production givss as the value of the total output of the Butte district for the year $4,675,150.70. We have purposely omitted the statement of bullion ehipped hy the express company ae, in ordsr to save express rates, which are regulated according to the value of the hullion, shippere almost invarihly misrepresent the value of their consignments.

There are, at least, 300 good minee heing worked at Butte, so the reader can see the impossihility of our even mentioning them.

The Silver creek minos, wbere placer mining is still carried on, have now 146 stamps at work on quartz. The Drum, Lnmmon, Belmont, Cotter and Hickey, Whippowill and Gloster, are the principal ones.

Ten-Mile district is situated on the west side of Red mountain, on the upper portion of Ten-Mile creek, snd in the southwest cornsr of Lewie and Clarke connty. The distriot embraces an area of ahont 16 miles, and is ahout 20 miles nistant from Helena. The main cluster of minee of this camp forms a network along the westem slope of Red mountain.

Red Mountain district, 16 miles south of Butte, will yet prove very productive. The Gregory and Alta-Montana mines of Jefferson district; the Hecla Consolidated mine; the Tront; the Algonqnin of Phillipshurg; the Prospect of Madison connty; the Legal Tender and Last Chance, and dozsns and dozsns of others might he mentioned in an interesting way, did space permit. Suffice it to say that coming railroad facilities will very much broaden the mining possibilitiez of Montana in the near future.

Idaho.

Idaho bullion returns foot up according to Wells, Fargo & Co. $2,834,474, against $1,894,747 in 1880. During 1881 the Wood river country mado rapid advances. The region attracted more attention than other and older regions of the Territory. Up to last year ores were shipped to Salt Lake, and even in 1881 there have been shipped to Salt Lake City from Eastern Idaho, 5,728,741 lbs. of ore during the season of 1881. This contained 3,851,807 lbs. lead, 361,811 ozs. silver, and 645 ozs. gold. The hase hullion prodect of Eastern Idaho, from local smelters, was 796,319 lbs., containing 80,856 ozs. silver and 112 ozs. gold.

Hon. J. J. Lewis, of Ketchum, Idaho, wrote for the very comprehensive and excellent holiday numher of the Butte *Miner* an article giving a history of the Wood river mines, in which he states that it is estimated that 8,000 tone of ore and hullion have been mined and shipped out of the Wood river country this year, representing $1,100,000 in value. Large amounte of ore are left on the dnmps to winter over.

Several silver mills and smelters were taken into Galena, Saw Tooth and Smiley's Basin during the summer, and have been put under conrse of erection. Some of them are nearly completed, and no douht will all be ready in the spring to tnrn out fine and hase hullion in large quantities. A large portion of the ores in Saw Tooth and Smiley districts are milling and of high grade. In tbe districts on Wood river helow Galena City, galena and carhonate ores predominate, the general average of which is ahont 100 ounces per ton silver and 60% lead. The experience of emelting on Wood river provse the fact that there is no difficulty in reducing raw ores of the section with watsr-jacket furnacss. Lime and iron are the principal fluxes needed, of whioh there are plenty to he bad, of the hest qnality. Work ie heing prosecnted this winter on most of the prominent mines throughont this mineral helt. Thousands of tone of ore will he on the dumps hy the opening of the spring market. From the present outlook, very lively times are expected next season.

The Saw Tooth region, the Salmon river conntry, Snake river, Silver City, and many other parts of Idaho, are all producing well, bnt want of space prevente our even summing np results of the various districts, except in figures which show aggregate returns, as we have given above.

Washington, Dakota and Alaska.

Our review has already exceeded the limits set to it, so we must conclude by only brief reference to the above-named Territories.

Washington never did make very much of a showing as a mining region, and this year it shows only $100,963, which is even somewhat less than the year previous.

Alaska mines are mainly confined to the Harrisburg region. Mr. Valentine estimates the yield at $13,000; but a very much larger yield is claimed for it by those interested in the region. The unpropitious climate of the country is a drawback to prospecting, yet a good many miners seem to hunt around there in the summer months.

Dakota sends for 1881, $3,550,000, as against $4,123,081 in 1880, a marked decrease in view of the total sum. This is almost entirely from the Black Hills region.

Dividends and Assessments.

Before giving any figures about dividends and assessments, it is well to state that though they serve as a basis for comparison between one year and another, they are by no means to be considered as reliable indications of the state of the mining industry. There are hundreds of mines in every direction which neither advertise their assessments or their dividends, and the figures from these mines are therefore never made public. In this State particularly there are hundreds of mines which are paying their owners good profits, but which are never heard of by outsiders, and which make no figure at all in the dividend returns as published. Mines which are owned by incorporated companies, or which have stock which is quoted on the boards are those which appear in the list of dividends and assessments. The following tables compiled by the *Exchange*, will, however, give a good idea of this branch of the subject. Of course, the showing is a very imperfect one as showing the whole result, for there are thousands carrying on the business whose operations are not made public. But so far as incorporated companies go we believe the record is very nearly correct. The total assessments levied for the year amount to $7,497,510, of which at least two-thirds have been levied by companies operating on the Comstock lode. On the other hand, the dividends for the year foot up $15,047,068.

Following is a list of the assessments for the year:

Nevada.

STOREY COUNTY.

The Comstock, 54 mines	$5,355,300

ELKO COUNTY.

Argenta	$40,000
Belle Isle	25,000
Blue Belle Con	20,000
Grand Prize	115,000
Howe	10,000
Independent	35,000
Navajo	45,000
Tuscarora	30,000
Total	$320,000

ESMERALDA COUNTY.

Equator	$25,000
Holmes	20,000
Juniata Con	2,000
Lodi	15,000
Metallic	12,500
Mt. Potosi Con	10,000
Real del Monte	75,000
Tilden	10,000
Vanderbilt	10,000
Total	$179,500

EUREKA COUNTY.

Albion Con	$202 500
Phenix	5,000
Total	$207,500

HUMBOLDT COUNTY.

Paradise Valley	$7,000

LANDER COUNTY.

Betty O'Neal	$75,000

LINCOLN COUNTY.

Day	$ 30,000
Hillside	100,000
Meadow Valley	48,000
Total	$178,000

LYON COUNTY.

Silver City	$6,310

NYE COUNTY.

Alexander	$150,000
Belmont	25,000
Gila	25,000
Liguria	25,000
Total	$225,000

WHITE PINE COUNTY.

Martin White	$45,000
Star	40,000
Ward Beecher	20,000
Total	$105,000

California.

MONO COUNTY.

Addenda	$10,000
Bechtel	25,000
Belvidere	30,000
Blackhawk	15,000
Boston Con	50,000
Con. Pacific	55,000
Champion	25,000
Defiance	5,000
Double Standard	25,000
Goodsaw	30,000
Jupiter	10,000
Maybelle	36,000
McClinton	3,000
Mono	175,000
Noondsy	75,000
North Noonday	75,000
Oro	73,400
Red Cloud	20,000
South Bulwer	25,000
Spaulding	10,000
Syndicate	25,000
Total	$808,400

Arizona.

Head Center	$30,000
Northern King	25,000
San Pedro	10,000
Total	$65,000
Grand Total	$7,497,510

The Dividends.

Following is the dividend record for the year, embracing the copper mines of Lake Superior and the mines of Colorado:

Arizona.

Copper Queen	$150,000
Grand Central	250,000
Silver King	300,000
Tiptop	120,000
Tombstone	600,000
Vulcan	40,000
Western	775,000
Total	$2,265,000

California.

Black Bear	$45,000
Bulwer Con	10,000
Gold Stripe	65,500
Great Western, Q. S.	25,000
Green Mountain	100,000
Idaho	263,500
Inyo Con	35,000
Magalia	15,000
Napa Con., Q. S.	90,000
New York Hill	100,000
Plumas Eureka	135,469
Plumas W. & M. Co	7,500
Quicksilver Mining Co	525,391
Rising Sun	25,875
Sierra Buttes	76,250
South Yuba	82,500
Spring Valley	50,000
Standard	675,000
Yuba	8,000
Total	$2,630,085

Colorado.

Bonanza Develop Co	$135,000
Catalpa	180,000
Chrysolite	500,000
Dunkin	110,000
Evening Star	425,000
Gem	2,750
Glass-Pendery	25,000
Hibernia	150,000
Iron Silver	400,000
Leadville Con	20,000
La Plata	180 000
Morning Star	50,000
Moore M. S. Co	30,000
Polonia	12,000
Robert E. Lee	50,000
Robinson	450,000
Silver King	50,000
Total	$2,770,750

Dakota.

Deadwood-Terra	$900,000
Father De Smet	130,000
Homestake	360,000
Total	$1,300,000

Georgia.

Con. Gold	$28,000
Total	$28,000

Mexico.

Jocuistita	$200,000
Total	$200,000

Michigan.

Calumet & Hecla	$2,000,000
Central Copper	120,000
Lake Superior	100,000
Osceola	225,000
Quincy	320,000
Total	$2,765,000

Missouri.

St. Joseph Lead	$60,000
Total	$60,000

Montana.

Alice	$400,000
Boston & Montana	100,000
Gagnon	5,000
Hecla Con	75,000
Total	$640,000

Nevada.

Brown & Urton	$8,333
Eureka Con	255,000
Exchange S. M. Co	25,000
Indian Queen	63,750
Navajo	25,000
Northern Belle	400,000
North Belle Isle	15,000
Richmond	810,000
Starr-Grove	120,000
Total	$1,082,083

Utah.

Christy	$30,000
Horn Silver	300,000
Ontario	850,000
Stormont	20,000
Total	$1,194,000
Grand Total	$15,662,068

Mining Accidents.

Although not perhaps strictly belonging in a mining review, we give the following list, compiled by the *Chronicle*, of the mining accidents which occurred during the past year.

January.

6. Sierra Nevada mine—August Swenson, carman, was killed on the 2300 level by something falling on him from above.

24. Liberty Hill, Cal.—R. Avery killed by falling of derrick.

25. Virginia City, Union shaft—W. H. Abbott, pumpman, struck by buckboard, fell 50 ft.; torn by hob; died.

February.

3. Union mine, Nevada—McQuarry fell 100 ft.; he broke no bones.

14. Placerville, Lyon gravel mine—Philip Walford run over by a car and fatally injured.

23. Quaker Hill, Cal., at Sargent & Jacob's drift mine—H. F. Bulleman's arm was cut off by machinery.

24. Zeile mine, Amador county—John Retallic killed by a blast of Giant powder.

March.

10. Derbec mine, North Bloomfield, Nevada county, Cal.—William Harrie killed by being thrown out of a car 300 ft. down the shaft.

11. Virginia, Nev., Union shaft—M. McLanmon killed and J. C. Cavanaugh dangerously injured by fall of section of pump column.

18. Tombstone, Goodenough mine—Robert Lynch killed by falling into a shaft.

26. Scott's Flat, hydraulic claim—Two Chinese miners killed by a cave.

April.

2. Brandy City, Cal.—Alexander Arnott killed by blast in gravel mine.

8. Tombstone, Empire mine—William Connors was killed by falling 300 ft. down a shaft.

9. Nevada City—John Pascos killed by a cave while prospecting.

20. Bodie—Frank Allen by explosion of Giant powder caps near is cabin; lost both his hands, and was otherwise severely lacerated.

22. Eureka, Nev., Richmond mine—Ed. J. Bennett killed by a cave.

May.

18. Virginia City, in the Forman shaft—James Perry's skull was crushed by a falling rock; he died on 23d.

19. Silver Reef, W. T., Christy mill—H. Thomas, amalgamator; caught in belt; died next day.

25. Auburn, Or.—Three Chinamen tunneling killed by cave.

June.

1. Ward, Nev., in the Martin White tunnel—A miner rendered unconscious by fumes of powder narrowly escaped death by explosion.

4. Eureka, Nev.—Mike Mulligan was killed by falling down a shaft.

5. Virginia City, in the Andes mine—Maloney, Hunter and Sanders were suffocated by gas.

8. Man killed by falling 400 ft. down shaft.

9. Bodie, in Bechtel mine—Norman McSwain killed by explosion.

13. Oscsola, Nev.—C. Penalula, foreman of the Crescent & Eagle mine, fell down shaft 40 ft. and was killed.

24. New York Hill mine—William Keyes much injured by explosion of blast.

27. Grass Valley, Sebastopol mine—Fire; loss $12,000.

July.

18. Bodie, Bechtel mine—Alex. Larsen was killed by a fall from the 200 to 400 level.

25. Forest City, Sierra county, Bald Mountain mine—David Curnow was crushed by a car of dirt against the timbers of the tunnel, and died five hours afterwards.

26. Idaho mine, Grass Valley—Richard Wedlock was killed by a cave.

August.

3. Near Baker City, Or.—At hydraulic mine, Porter was killed by the caving of a bank.

18. Nevada City mine—McNally seriously injured when endeavoring to jump on a moving car.

Nevada City, Murchie's mine—Philip Dunn badly hurt from fall caused by a broken chain.

28. Mineral Creek, A. T.—Charles Horn fell in a shaft 15 feet, breaking ribs.

September.

24. Idaho Mine, Grass Valley—John Eustis' foot was so crushed by machinery that amputation became necessary.

26. Moore's Flat, Nevada county—Works of Blue Bank hydraulic mine covered up by landslide; damage, $200,000.

October.

6. Grand Central mine, A. T.—James Sully, carpenter, was killed by falling down the shaft.

7. Sulphur Bank quicksilver mine, Lake county—Twelve men were suffocated by a cave in the air shaft.

8. Eureka, Nev., Boston mine—Patrick Haggerty and Quinlan Harrington fell down shaft 110 feet, but were not killed.

9. Savage mine, Virginia City, Nev.—Andrew Neenan was killed by being thrown from the giraffe down the chute.

Sierra Nevada mine, Virginia City—Jeremiah Harrington died from being overheated.

November.

11. Mokelumne Hill, Coral Flat mine—Engineer John Laswell's clothing was caught by cogs, his body thus passing between the wheels and he was killed.

27. Eureka, Nev., Consolidated mine—John O'Keefe, water carrier, fell down shaft 500 feet and was instantly killed.

29. Relief Hill, Nevada county—William Corbett was caved on and then washed through a flume; dead.

December.

3. Virginia City—T. Matthews fatally scalded by hot water.

Virginia City, Forman shaft—Thomas and Rowe killed by explosion of Giant powder cartridge.

10. Moore's Flat, Nevada county—The ridge slid down on Blue Banke hydraulic mine, burying the works.

21. Mount Zion, Nevada county, drift mine—L. Pendleton crushed to death by timbers giving away.

Conclusion.

We have confined ourselves mainly to precious metal mining in this article, especially when speaking of California. To more than refer to quicksilver, copper, coal, iron, etc., would far exceed the limits which our space admits.

After a successful run of the Modoc Co.'s furnaces at Lookout, Inyo county, Frank Fitzgerald, the lessee, has shipped 28 tons of rich bullion. Average value of bullion per ton in silver, $680.50; gold $23.60; total, $709. Total value of shipments, $21,000.

Subscribe for the Mining and Scientific Press, and get all the current reliable news from the various mining camps on the coast. The price is only $4 a year, post paid.

Copper.

The price of copper has recently advanced, much to the gratification of people owning copper mining properties. And already it is exercising an appreciable effect on this branch of mining, as copper properties are more sought for and command more attention than they have for a long time past. The market here may be quoted as follows: Sheet, 20c; cement, 100 fine, 15½@—c; bar copper, 22c. We quote manufactured copper, per lb.: Braziers' ordinary sizes, 16 oz. per square foot and over, 33c; locomotive fire-box sheets, 33c; Braziers' ordinary sizes, under 16 oz., and over 12 oz. per square foot, 35c; all sheets 10 and 12 oz. per square foot, 37c; all sheets under 10 oz. per square foot, 39c; circles less than 34 inches diameter, 36c; do. 34 inches diameter and over, 39c; segment and irregular pattern sheets, 36c; sheathing (sheets 14x18) 14 to 34 oz., 31c; bolt copper, 33c; ingot copper, 22c.

Jas. Lewis & Sons, of Liverpool, report that during the first part of December, copper gradually advanced £3 per ton and during the latter part, £1 per ton. This advance has been caused by the increasing scarcity of copper, the disinclination of holders to part with it, and the steadily improving statistical position of the metal; although as is customary at the end of the year and in consequence of the holidays, the deliveries and sales have been on a reduced scale. On Dec. 6th, the smelters advanced the prices of English copper £3 per ton, and again on the 16th to £85 for India sheets, and £86 per ton for other sheets. Tough cakes on the 1st inst. was quoted at £71 to £76, and select ingot £76 to £78 per ton.

The arrivals from Chile have been 2,418 and the deliveries 3,265 tons; and from other countries 2,235 and 2,391 tons respectively.

The sales of furnace material for December include 1,465 tons of precipitate, ranging from 13 shillings to 14 shillings, 6 pence per unit.

Quotations on the 1st inst. were, good ordinary brands £70, 17s. 6d. to £71, 5s., and with three months prompt £71, 10s. to £72 per ton. Ore 14s. 0d; regulus 14s. 6d. to 14s. 9d. per unit.

Chile exports for the year amount to 39,037 tons fine. Stocks of West Coast produce are equal to 25,836 tons fine, against 26,683 tons on Dec. 1st.

Lodes in Placer Claims.

There has been more or less discussion on the subject of the discovery of lode claims within the boundaries of placer claims, as to the rights of the owners under certain circumstances. The Commissioner of the General Land Office sets the matter at rest in one way, at least, so far as a department of the Government (aside from the courts) can do such a thing, by deciding that lodes discovered within the limits of placer claims, after application for patent for the placer claim was filed, are no bar to the issuance of a patent as applied for.

A man named Becker claimed to be the owner of a lode claim, located many years before, which a man named Sears had fraudulently included in a placer survey. Becker protested against a patent being granted to Sears. The land office directed that testimony should be taken upon the two following points, to wit: First, whether a lode actually existed as alleged; and second, whether such lode conformed to the diagram required to be submitted. Protestant having complied with the requirements stated, the hearing was held.

After the date of hearing, Sears filed a relinquishment of the area embraced in the Soda lode survey. Other people also filed affidavits since, alleging that there are a number of lode claims other than the Soda lode, and that these affiants were working them.

The commissioner says: "These affiants allege nothing which will warrant this office in further suspending proceedings for patent. The fact, if admitted, that lodes are now known to exist within the placer claim, constitutes no bar to the issuance of patent, provided they were not known at the date of application for patent. The applicant, at the date of application, alleged under oath, that no such lodes were known to exist, which allegation was supported by corroborative affidavits. I think the testimony taken at the hearing clearly shows, that while there is a natural fissure filled with miscellaneous material which was located at the Soda lode, there never has been a pound of mineral-bearing ore taken therefrom, although it would seem that at different times various persons have thoroughly prospected the same by shafts, tunnels and other excavations. Therefore, the fact that the applicant has relinquished the area claimed as the Soda lode, does not, in my opinion, affect the *bona fides* of the persons who made oath to the effect that no known lodes existed at the date of application for patent."

A rich strike was made at Gray's Flat, El Dorado county, the other day, resulting in a clean-up of over $11,000 in gold. The point where this strike was made on Monday is but a short distance from where the Grays cleaned up about $100,000 from a chimney a few years ago, and this one gives promise of being equally as prolific.

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POWER WITH SAFETY.

Used in Europe for six years; on this Coast since January, 1881. No accident has ever occurred in storing, transporting or handling it. Is shipped all over the world, and is the favorite explosive, especially in extremely hot and cold climates.

Does not contain any Nitro-Glycerine, Chlorate of Potash, Sulphur, nor any other substance which explodes by friction.

The Only Really Safe High Explosive.

TONITE always retains its strength, there being no liquid substance in it to leak out. It is always uniform and reliable. No climatic change has any effect on the quality of TONITE. In hot or cold atmospheres of any extreme, it undergoes no alteration. The price paid for TONITE is for the power inherent in it and always remaining in it, while Nitro-Glycerine mixtures constantly vary in strength, and age destroys their explosive quality altogether.

We are Prepared to **SELL LOW** and give Best Value.

We Manufacture, also, Detonators, Electric Exploders, Etna Caps, Torpedoes, Distress, Fog and Alarm Ship Signals.

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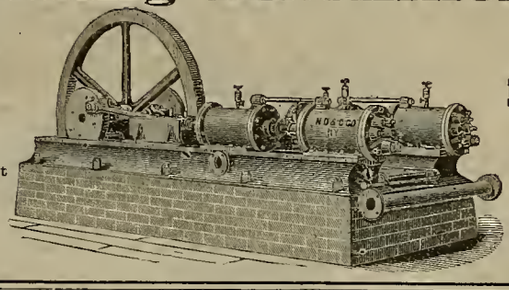

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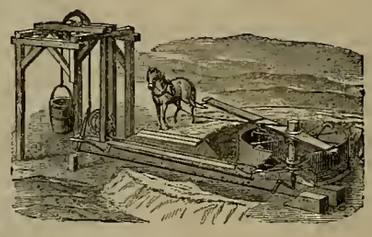

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One Horse can easily heist over 1,000 pounds at a depth of 500 feet. The whim is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The standard of the whim is bolted to bed-timbers, thus avoiding all frame work. When required these whims are made in sections to pack on mules.

Palmer's Safety Clutch

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Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

E. BUETTNER, C. E.

Mining Engineer.

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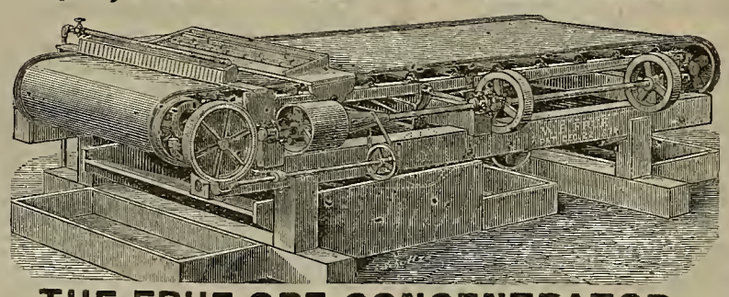

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Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.

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The direct, shortest and cheapest route for freight and passengers to the following mining towns and camps: Aurora, Bodie, Bridgeport, Belleville, Candelaria, Columbus, Benton, Montezuma, Silver Peak, Alida Valley, Bishop Creek and Gold Mountain.

C. and C. R. R. trains make close connection at Mound House Station with trains of Virginia and Truckee Railroad, making close connection at Reno with East and West bound trains of the C. P. R. R.

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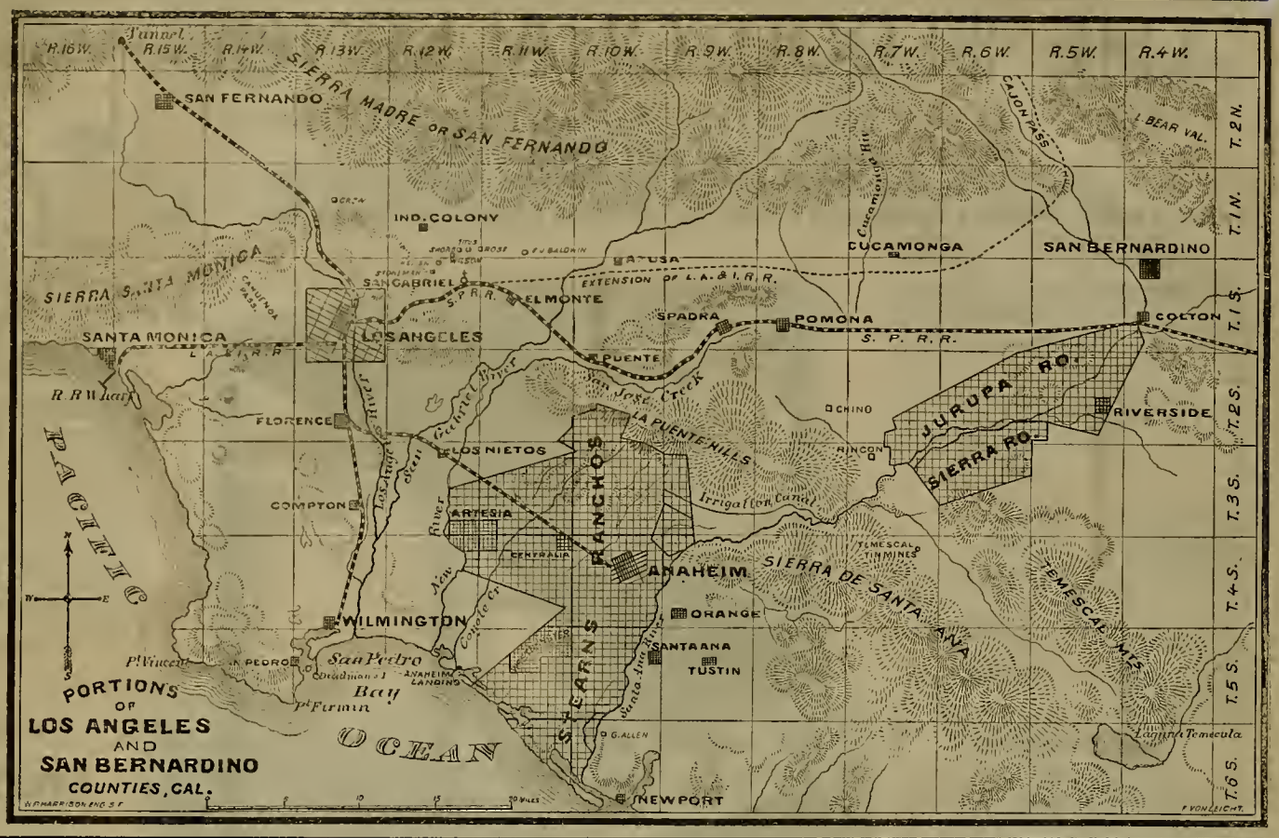

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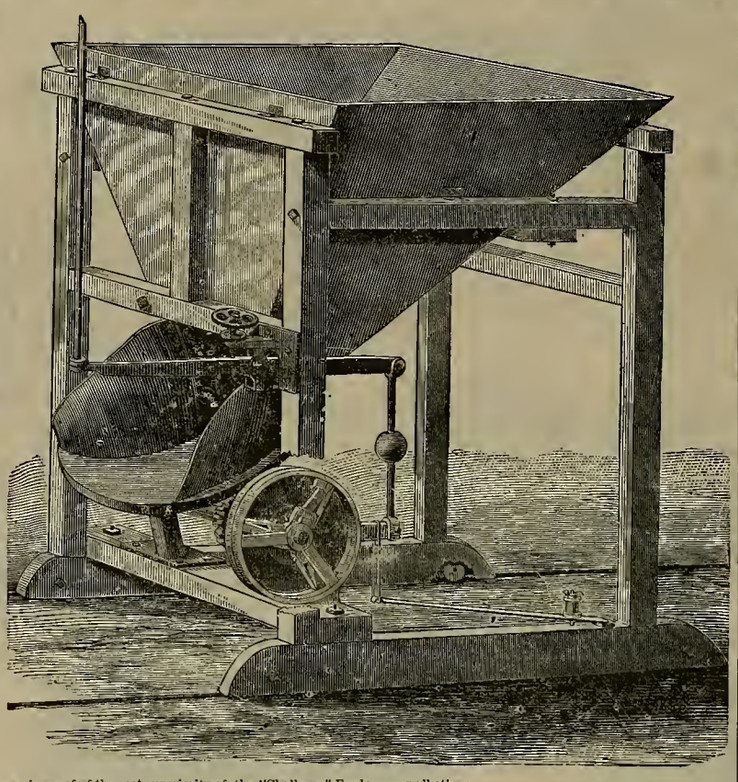
Sheep-Ranch	20	"	Calaveras " "
Mahoney	40	"	Amador " "
Zeile	40	"	" " "
Placerville	40	"	El Dorado " "
Gross	80	"	" " "
Julian	20	"	Placer " "
St. Patrick	15	"	" " "
Providence	20	"	Nevada " "
Omaha	10	"	" " "
Green Mountain	60	"	Plumas " "
Plumas-Eureka	60	"	" " "
Bulwer-Standard	30	"	Bodie Dis,. Mono, "
Standard	20	"	" " "
Noonday	30	"	" " "
Bodie	10	"	" " "
Christy	5	"	Uintah Co , Utah.
Ontario	40	"	Parley's Park, "
Contention	20	"	Tombstone Dis, Arizona
Grand Central	20	"	" "
Harshaw	20	"	Patagonia, "
Sunshine	20	"	Idaho Springs, Col.
Homestake	200	"	Black Hills, Dakota.
Father De Smet	80	"	" "
Hidden Treasure	40	"	" "



Superiority of the "Challenge" Ore Feeder Demonstrated!

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The "Harshaw" or "Hermosa" Mill, of Patagonia District, Arizona, was also originally fitted with "Eclipse" Feeders, but after a few weeks trial they were pronounced inadequate to the work, discarded, and the "Challenge" adopted.

The "Silver King," Mill of Arizona, also removed the "Eclipse" Feeders to give place to the "Challenge."

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Four of the "Victor" Feeders, manufactured by E. T. Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.

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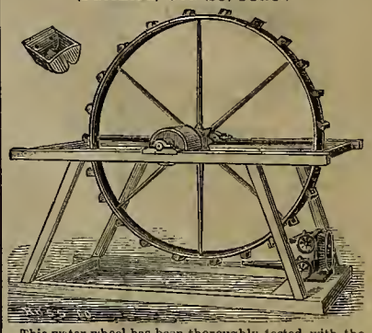

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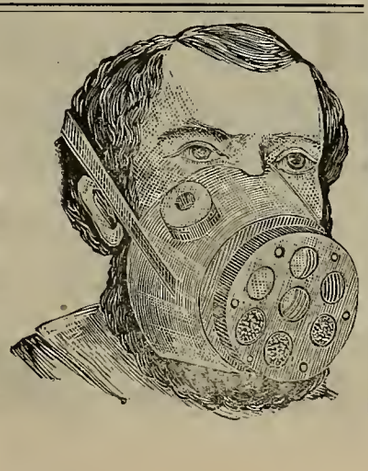

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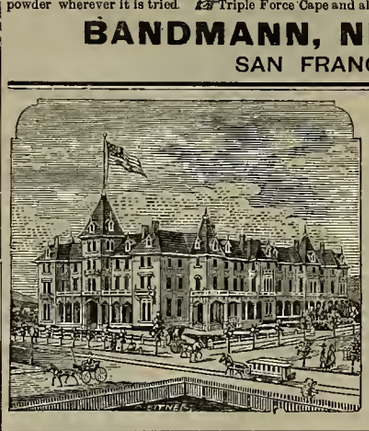

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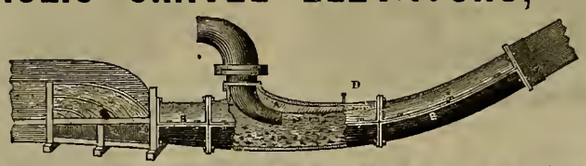

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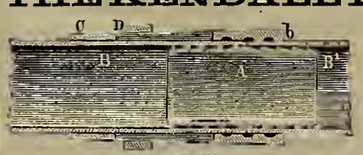

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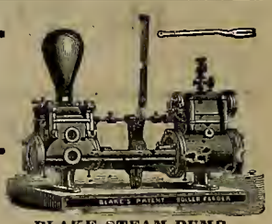

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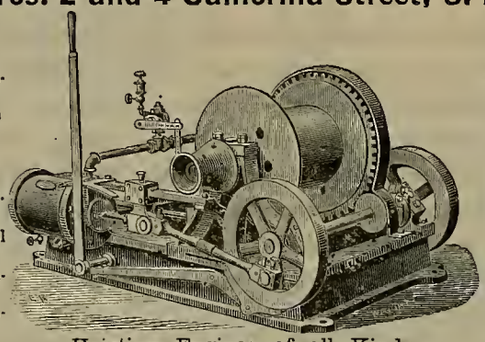

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Disston's Circular Saws.
New York Belting & Packing Co.'s Rubber Belting, Hose, Packing, etc.
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HERCULES SLAYING THE GIANTS.

HERCULES POWDER

Derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

—o—

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

No. 1 (XX) is the Strongest Explosive Known.
No. 2 is superior to any powder of that grade

PATENTED IN THE UNITED STATES PATENT OFFICE.

—o—

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ENGINE LATHES IN SECTIONS.

Limit of weight for 25-inch Lathes, 300 pounds. For 17-inch Lathes, 150 pounds.

Standard and Special Machine Tools.

SAN FRANCISCO TOOL CO., No. 21 Stevenson St., San Francisco.

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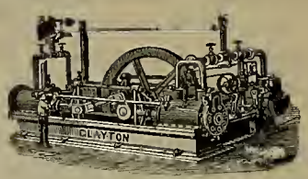
—AND—

INGERSOLL ROCK DRILLS.

INGERSOLL ROCK DRILL.



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Having been appointed Sole Agent for this Compressor, I will keep a full stock of the different sizes in store. Prices much less than any First-class Compressor in the market. ☞ SEND FOR CATALOGUE. ☜

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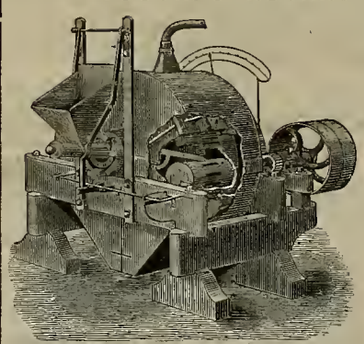
Sole Agent for the Ingersoll Rock Drill and Clayton Compressor Co.

TUSTIN'S ROTARY PULVERIZING MILL.



WORKS ORE WET OR DRY,

And Feeds Itself Automatically.

Patented October 11, 1881.

One of these machines can be seen at the Ore Sampling and Pulverizing works of Hofmann Bros., No 415 Mission St., where it is working every day. Weight 5,000 lbs., heaviest piece 480 lbs.

Manufactured at the

TUSTIN WINDMILL, HORSE POWER AND PUMPING MACHINE WORKS.

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By W. I. TUSTIN, Inventor and Patentee.

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RAILROAD AND MERCHANT IRON,

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HIGHEST PRICE PAID FOR SCRAP IRON

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ASSAYER AND ANALYTICAL CHEMIST,
118 & 120 Halleck Street,
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ASSAYING TAUGHT.
☞Personal attention insures Correct Returns.☜

Nevada Metallurgical Works,
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Near First and Market Streets, S. F.
ESTABLISHED, 1869. C. A. LUCKHARDT, Manager.
Ores Worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, Etc.
Working Tests (Practical) Made.
Plans and Specifications furnished for the most suitable process for working Ores.
Special attention paid to Examinations of Mines, plans and reports furnished.
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IMPORTERS OF AND DEALERS IN
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MINE and MILL SUPPLIES,
CHEMICAL APPARATUS AND CHEMICALS, DRUGGISTS' GLASSWARE AND SUNDRIES, Etc.
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We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.
Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.
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ALEX. DEL MAR,
Mining Engineer,
Late Director of the United States Bureau of Statistics Mining Commissioner for the United States Monetary Commission, etc., No. 216 Sansome St., San Francisco. Cable address—"Del Mar, San Francisco." Branch Office, 61 Broadway, New York. Cable address—"Del Mar, New York." London Agency: H. Stodes & Co., 24 A, Southwark St., S. E. Cable address—"Del Mar, London" Paris Agency: J. H. McDonald & Co., 13 Rue St. Lazare. Cable address—"Del Mar, Paris."

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METALLURGICAL WORKS,
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Practical Instruction given in Treating Ores by approved processes.
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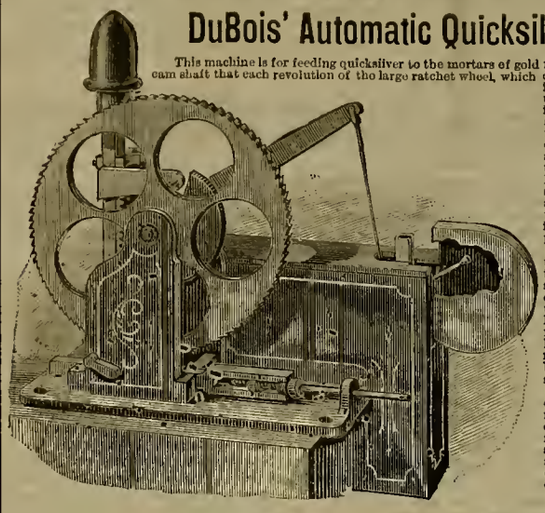
FRANCIS SMITH & CO.,
Manufacturers of
THE PATENT CHANNEL IRON WHEELBARROWS.
THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand
SHEET IRON PIPE.
Lap-Welded Pipe, all Sizes, from Three to Six Inches. Artesian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.
Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all sizes of Pipes with a composition of Coal Tar and Asphaltum.
Office and Manufactory, 130 Beale Street, San Francisco.

SHEET IRON PIPE.

DuBois' Automatic Quicksilver Feeder.

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.
The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.
A chief point of excellence of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; *i. e.*, from every one to four minutes.
Price, complete, $100.
For Sale by **WHITNEY & MARSHALL,** Sole Agents
22 & 24 Fremont St., San Francisco.
Dealers in Iron, Steel, Hardware and Mining Supplies, Wrought Iron Pipe and Fittings, Pump Columns, Wire Rope, etc. A large stock of Boiler, Plate and Sheet Iron of every description.

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MANUFACTURERS OF
Gold and Silver Grinding and Amalgamating Machinery

HOWLAND'S PULVERIZER Takes the Place of the Cumbersome Stamp Mill and can be put up in one day ready for work.
IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt. Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill. It requires twelve-horse power.
Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver ores, Chloridizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill supplies. Iron Work complete for Wood Frames, also
SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.
☞Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
MOREY & SPERRY—Warerooms, 92 and 94 Liberty St., N. Y.

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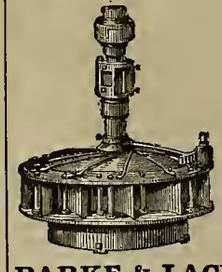
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The "OLD RELIABLE" with improvements, making it
THE MOST PERFECT TURBINE NOW IN USE.
Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
JAMES LEFFEL & CO., Springfield, Ohio, and 110 Liberty St., N. Y. City.
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STEEL CASTINGS
FROM 1-4 TO 10,000 lbs. WEIGHT.
True to pattern, sound and solid, of unequaled strength, toughness and durability.
An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over other Steel Castings.
CRANK SHAFTS, SHOES, DIES and GEARING specialties.
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MINING ENGINEER,
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☞Agent for PADDOCK'S Ore Dressing Machinery. Mining Machinery supplied.

San Francisco Cordage Factory.
Established 1856.
Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
Extra sizes and lengths made to order on short notice.
TUBBS & CO.,
611 and 613 Front Street, San Francisco

SELBY
SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.
Gold and Silver Refinery And Assay Office.
HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

New Mining Horse Power.

The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
C. H. BAKER,
Agent and Manufacturer of Mining Machinery
38 and 40 Main St., S. F.

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PATENT DETACHABLE TOOTH SAWS,
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Philadelphia Chemical Stoneware Manufactory,
1100 E. Cumberland St., Philadelphia, Pa.
Manufacturer of all kinds of Chemical Stone Ware for Manufacturing Chemists. Also, Chemical Bricks for Glove Towers.

M. C. IHLSENG, E. M., Ph. D.
Civil and Mining Engineer.
Formerly of Columbia College School of Mines, now of Colo. State School of Mines, will examine, survey and report on property or methods. Box 409 Golden, Col.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING JAN 10, 1882.

252,084.—DIRECT-ACTING ENGINE—Geo. E. Dow, S. F.
252,216.—ELASTIC COMPOUND FOR TRUSS PADS—H. W. Hendricks, Portland, Oregn.
252 108.—TRACK COUPLING—Geo. W. Hunter, Merced.
252,116.—WINDMILL—T. E. Martin, San Jose, Cal.
252,234.—HARROW—Thos. Mathieson, Almaden, Cal.
252,250.—BLASTING POWDER—W. R. Quinan. S. F.
252,143.—DEVICE FOR HANDLING COOKING PANS—J. W. Ross, Santa Clara, Cal.
252,145.—MAGAZINE FIRE-ARM—A. Schneider, S. F.

FOR THE WEEK ENDING JANUARY 17, 1882.

252,414—BOX COVER PRESSES, E. Austin, Winters, Cal.
252,318—COMBINED POTABLE PANTRY, DRESSER AND SIDEBOARD, L. G. Hudson, Stockton, Cal.
252,385—RUBBER STAMP CABINET, C. A. Klinkner, S. F.
252,333—CROSSCUT SAWING MACHINE, W. H. Smith, Portland, Or.
252,408—SIDE-BOARD, Geo. B. Wilbur, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Cotton Hose.

Cotton hose is now made for fire and garden use, which can be put away for years and its strength not be impaired by mildew or rot. For miner's use all know how effective cotton hose is. It is made rubber lined and prepared mildew proof. Thie hose, which is advertised in another column, is in nee in fire departments of Enreka, Santa Clara, Alameda, San Rafael, Sacramento and Santa Cruz, in this State, and in Carson, Nevada. What is thought of the hose hy those who have used it, is best shown by one of the late lettere abont it, which is as follows:

Copy.

SANTA CLARA, CAL., Jan. 16, 1882.

C. A. Edson, Esq., Chairman F. and W. Committee, Alameda Cal.—DEAR SIR: In reply to your inquiry as to what the firemen of this town think of the cotton hoee in use here, I will eay they like it very much. They have not had it in uee long enough to test ite dnrability, hut npon that ecore, the Fire and Water Co. made full investigation, and were eatisfied. We had occasion to purchase 1,000 ft. of fire hoee lately. We hought 500 ft. Malteee Cross rubher hose and 500 ft. Paragon cotton hoee. It is my opinion, as well ae the opinion of othere interested in fire department matters, that it would have heen for the hest intereste of the town to have purchased Paragon cotton hose entirely. Our reasons are: First, we helieve it to he ae dnrable as the rubher hose, if not more so; second, it ie lighter to handle, and third, it occupies lese space on the reel. Yours, etc.,

JNO. A. NACE, of F. and W. Com.

I fully concnr in Mr. Nace'a opinion in regard to the cotton hose.

R. MENZEL, Foreman Hoae Brigade.

News in Brief.

BETWEEN $700 and $800 worth of wire gold has heen taken from the Ontario mine, at Butte, M. T.

THE Canadian Prese Association is urging the government to take ateps to aholish postage on newepapers.

SEATTLE had a $1,500 hlaze ou Monday evening, heginning in a Chinese wash-house on the west aide of Washington atreet.

THE sentence of Alvino Pico, convicted of larceny at San Jose, has been deferred to give time for inquiring as to his sanity.

TWO HUNDRED destitute Russian Jews reached Hamhurg on Wednesday. They are endeavoring to ohtain aid to proceed to America.

THE delinquent tax list of Nevada county amounta to $20,000, inclnding over $12,000 due from the Central Pacific railroad company.

IT is aaid that $1,500 has been offered for a seat in the San Francisco Produce Exchange, which ie $500 more than the price fixed hy the Directore.

NYE Co., Nev., is the largest county in the United States, covering 24,000 sqnare miles; San Bernardino, Cal., with 23,000 square miles is the next largest.

THE Virginia *Enterprise* contains the following interesting itema ahont the hydraulic pump:

The hydraulic pump at the Chollar-Norcroee Savage shaft is running well and emoothly under the natnral flow and pressure of water bronght from the big reservoir on the side of Mt. Davidson. The water comes to the top of the shaft under a pressure of 440 ft. vertical, and the pump heing 2,400 ft. helow the surface, a preesure of 2,840 ft. is tins exerted upon it. The pump started off at 3⅜ strokee per minnte, hnt thia will eoon he increased to 4 strokes, if it hae not already been done. As the feed pipe from the reservoir is 12 inches in diameter, we may expeot to eee a great increase in the flow of water noted in the next report of the Sutro Tnnnel company; also, some marked changes in the temperature of the air and water at different points along the tunnel.

Horton's Wooden Pipe.

Some three and a half years since, a patent was ieeued to W. N. Horton, for an improvement in wooden water pipes, the principle of whioh ie to nnite the meeting ends of the lengths hy an iron hand, so that after the water is let in, the expansion of the wood will eoon make a tight joint; and as the water hes access to the ends of the pipe within the joint, it will permeate the entire eection through the poree of the wood, drawing the sap out, and keeping the wood in a water-eoaked condition, which is acknowledged hy all engineeretopreserve it and render it nearly indestructible. This pipe should not he mistaken for the ordinary common wooden pipe, which is made with a counter-hore at one end of each eection, the oppoeite end heing made small enough to enter the counter-hore of the next section, and thne unite the eections into lengths. This style of pipe is open to two serious objections. Firet, that when so united, the outer shell of the counter-hore is not exposed to the action of the water within the pipe, and will, in conseqnence, he apt to dry-rot and destroy the joint, and aleo the usefulness of the pipe. The eecond objection lies in the greater size which it is neceesary to make the pipe for a given diameter of bore, to provide for the counter-hored and reduced ende, to give these the requisite strength.

The succese which this pipe has met since the commencement of its nse, more than jnstifies the favorable opinions expreesed at that time. The patentee has a contract for some 20 milee of thie pipe, to he laid in connection with the water works at Ogden. Some 10 or 11 miles of eix and eight-inch pipe are already laid and in use, carrying water under a pressure of 90 lbs. to the inch. At a trial in Decemher last, water was throwu from an inch nozzle, by direct pressnre from the pipee, to a hight of 80 ft.

These worke give good satisfaction. Water passing through wood pipes receives no bad taste from the corrosion of the pipes or other causes.

This pipe coets, when laid, ahont two-thirds lees than cast iron pipe, and when the item of traneportation ie coneidered, the difference in weight ie very greatly in favor of the wood pipe. For particulars ae to cost, etc., address T. H. Horton, P. O. Box 2,328, San Francisco, Cal.

[Advertisement.]

More About Water Supply.

The demand on us for information hae recently become so great that we are unahle to reply to the letters daily received, and we havo thus found it necessary to puhlish this additional circular, and to provide the meane for meeting the demands of those who desire wells for domeetio, etock and other parposes. Ae a large demand for the *points* used in the constrnction of the driven wells has recently arisen here, it hae occurred to us that many of them are heing put down without authority or license. *The purchase of the point does not give the legal right to put down and use a well.* The driven well is the invention of Col. Nelson W. Green, of New York, and is secnred to him by lettere patent No. 73,425, No. 4,372 (re-issued) and No. 218,875. Theee patente have heen exhaustively litigated in the U. S. Circuit Courte, in the Statea of New York, New Jersey, Massachueetts, Iowa and Minnesota, and in every instance decided in favor of Col. Green. Because of the immense value and utility of these inventions, combinations of large means and influence have been made at different timee to defeat the collection of royalties and licenses. In one of these cases reported in 13th Blatchford, page 208, 19 days were occupied hy the most ahle counsel in the argument, and over 3,000 printed pages of evidence and briefa were before the Court on hehalf of the plaintiffs alone, and the expenses of the auit were over $100,000. The opinion was prepared hy Judge Benedict, and completely established Col. Green's claim at every point. Judgee Dillon, Nelson and Blatchford have all rendered opiniona to the same effect; and in a hundred other cases, arising out of collateral mattere, have the title and right of Col. Green been most fully sustained. Our object in making these statements is to

Caution

All persons against the nse of the driven well without authority, and to say that no person or persons have the legal right to put down or use a driven well in California without authority or license from us. We are the exclusive agents and attorneys of Col. Green, for the States and Territories west of the Rocky mountains, and intend to enforce and protect hie righte, ae well as our own, to the uses and heneits of these patents. Should any peraon offer to put down a driven well for you, request him to exhibit his authority from us, and if he is not ahle to do thie, you may rest aesured that you will be required, sooner or later, to pay license to us.

To answer the conatantly increasing demand for information, to guard against

Fraud and Imposition,

And to supply the orders as fast as they may arrive, we have made arrangements with the well-known house of

Huntington, Hopkins & Co.

To keep on hand all materials necessary for the construction of these wells, whioh will he shipped hy them on receipt of the price etated. Upon the receipt of such order hy them, or ns as etated helow, a full and minute letter of instructions as to the manner of constructing these wells will also be eent, so that anyone of ordinary sense can put them down ae perfectly as those especially engaged in the husiness. Thie letter of instructions—*together with the license*—will be eent with the goode. The articles eent will include everything necessary to a complete and perfect well, and also a pump of suffi cient capacity to deliver 900 gallons of water per hour. Without thie letter of instructions, and careful attention to the directions it containe, it ie more than likely that the attempt to put down a eatisfactory well would fail, and thus the goods furnished would prove a partial loes. In adopting theee means of putting the driven well within the reach of everyone, the expenses of employing an expert, eo called, are avoided, and the coet of the well is therehy eo reduced as to he within the reach of everyone. One of these welle cau he easily conetructed hy two men in two days—usually in one day—to a depth of 50 ft.

Where eeveral wells are required in the eame neighhorhood, the work can be greatly facilitated hy purchasing a few additional tools, costing not over $20. These mey he returned to us, if not broken, and one-half of the purchaee price will be refunded.

When desired, we will send an expert, for coet of transportation and $5 per day. Contracts for large water enpplies will he entered into hy us upon the most favorahle terms—*upon the basis of success or no pay.*

Material for welle not more than 40 ft. in depth, including pump and licenee, will he sent for $45. Wells of 50 ft. will be supplied for $50, and for eech foot over 50 ft., at 40 cts. per foot—to he sent, *in all cases*, hefore the goode are ehipped.

In eending your order, it will he of advantage also to send us as full and accurate a description of the proposed location of the well, the distance—or snpposed distance—of the water beneath the surface, the natnre of the soil from the enrface down—so far as known, the thickness of the different etrata, and any other facts likely to be of advantege to you and us in writing our letter of instructions. In any case where, from the statements of facts, we are satisfied water cannot he ohtained in eatisfactory supply, we shall eo state, and will immediately return your money.

We refer, hy permission, to: Chas. Miller, Esq., of Huntington, Hopkins & Co., junction of Bush and Market streets; Lemhert & Green manufaotnrers of H. & L. axle grease, 144 Natoina street; M P. Holmes, carriage manufactory, 327 and 329 Sutter street; Judge Robert Thompson, 76 Montgomery hlock; R. H. McDonald, President of the Pacific Bank. All of San Francisco.

For circnlars and other information, addrees BABCOCK, HOWARD & Co., 40 Merchants' Exchange, S. F., Cal.

NOTE.—No letter of instructione will be eent, except it ie eent with the goods.

Bullion Shipments.

We quote shipments since our last, and shall he pleased to receive further reports:

Hananer, 18th, $2,200; Germania, 28th, $1,500; Bullionville, 18th, $2,259; Horn Silver, 18th, $17,500; Tintic, 18th, $2,415; Barhee & Walker, 19th, $1,598; Horn Silver, 19th, $7,500; Hanauer, 19th, $2,300; Germania, 19th, $1,450; Leonore, 19th, $650; Moulton, 20th, $10,000; Horn Silver, 21st, $32,500; Bullionville, 21st, $2,059; Germania, 21st, $5,500; Hanauer, 21st, $2,300; Alice, 20th, $6,000; Horn Silver, 22d, $12,500; Bullionville, 22d, $14,709; Northern Belle, 16th, $4,548; Star, 13th, $3,020; Standard, 16th, $18,297; Contention, 14th, $17,403; Northern Belle, 18th, $2,761; Star, 16th, $2,862; Contention, 17th, $11,005; Tip Top, 17th, $10,000; Bodie, 23d, $8 500; Lyon, 18th, $33,450; Star, 20th, $3,253; Northern Belle, 21st, $5,057; Contention, 21st, $16,916; Leeds, 24th, $1,553; Eureka Con., 20th, $10,215.

New Incorporations.

The following company has been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

IMPROVED MACHINERY Co., Jan. 20th. Gbject, manufacturing, buying, selling and using machines of all kinds. Capital etock, $10,000,000. Directors, Hall McAllister, John Patten, Wm. R. Quinlan, Jos. Whitney and T. W. Ludovici.

GILMER-SALISBURY M. Co., Jan. 24th. Location, Lincoln Co., Nev. Capital stock, $10,000,000, in 100,000 shares. Directors, Jas. Heron, C. W. Banks, L. F. Rowell, S. D. Baretow and H. H. Hamer.

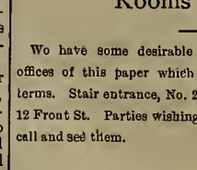
BODIE AND BENTON COMMERCIAL R. R. Co., Jan. 25th. Gbject, constructing a narrow-guage railroad from a point near Mono lake, in Mono Co., to the town of Bodie. The company propose to purchase timber lande on Mono lake, erect and operate sawmills, and transport the lumber therefrom to market hy means of their road. They aleo propose to conetruct a hranch road from the sonth end of Mono lake to a point connecting with the Carson & Colorado R. R., near Benton. Capital stock, $2,000,000, in 200,000 shares of $10 each. Directors, R. N. Graves, A. J. Ralston, H. M. Yerington, Thos. Menzies, Wm. Willis, J. B. Low and W. S. Wood.

LEVI ESTES, at one time a prominent, respected and wealthy citizen of Portlaud, was arrested on Monday, charged with aetting fire to Estes & Knott'a saw-mill, near Hnhhard's, ahout two months ago.

THE Bear mill, Deadwood distriot, Trinity county, is to be increaeed to 20 stampe, heing now 10.

Business Offices and Sunny Rooms to Let.

We have some desirable rooms to let adjoining the offices of this paper which will be rented on favorable terms. Stair entrance, No. 252 Market St. Elevator, No. 12 Front St. Parties wishing offices, etc., will do well to call and see them. DEWEY & CO.



Dewey & Co.'s Patent Agency and Newspaper Offices.

Dewey & Co.'s Patent Agency and the business offices of the Mining and Scientific Press, Pacific Rural Press, Pacific States Watchman and the Fraternal Record are now favorably situated at No. 252 Market Street. Elevator entrance, *No. 12 Front St., S. F.*

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. McGREW—Santa Clara county.
M. P. GWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
B. W. CROWELL—Humboldt and Trinity counties.
D. W. KELLEHER—Merced, Fresno and San Benito.
A. C. KNOX—State of Nevada.
EDWARD A. WEED—San Francisco.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walle d with aquaria is constantly receiving accessions of new fish and other marine life. Tho number of sea lione is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

BOOKSELLERS, STATIONERS, ETC.—Messrs. Payot, Upham & Co., No. 204 Sansome Street, are one of the oldest, most enterprising and reliable firms in the book and station ery trade in San Francisco. Scientific, industrial and foreign publications are a specialty with them. They are also noted for their first quality of blank hook and fine station ery line of goods.

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BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and eather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundaye excepted). Henry G. Hanks, State Mineralogist.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central systemin San Francisco.

San Francisco Metal Market.

[WHOLESALE.
THURSDAY, January 26, 1881.

IRON.—			
American, Pig, soft, ton	—	—	@30 00
Scotch, Pig, ton	25 50	@	27 50
American White Pig, ton	—	—	@— —
Oregon Pig, ton	—	—	@29 00
Clipper Gap, No. 1	—	—	@28 00
Clipper Gap, White	—	—	@32 00
Clipper Gap Car Wheel	—	—	@35 00
Refined Bar		4	@
Horse Shoes, keg		—	@ 5 50
Nail Rod		—	@ 7½
Norway, according to thickness		6½	@ 70
STEEL.—			
English Cast, lb		13	@ 15
Black Diamond, ordinary sizes		—	@ 15
Drill		15	@ 16
Flat Bar		16	@ 18
COPPER.—			
Ingot		—	@ 22
Sheet		—	@ 20
Sheating, Tinned 14x18		—	@ 31
Nails		—	@ —
Bolts		—	@ 33
Old		—	@ —
Bar		—	@ 22
Cement, 100 fine		—	@ 15½
LEAD.—			
Pig		—	@ 5
Bar		—	@ 6
Pipe		—	@ 8
Sheet		—	@ 8
Shot, discount 10% on 500 Bags			
Drop, per bag		—	@ 2 10
Buck, "		—	@ 2 30
Chilled "		—	@ 2 50
TIN PLATES.—			
10x14 I C Charcoal		—	@ 7 50
10x14 I C Coke		6 15	@ 6 40
Banca Tin		—	@22 50
Australian		—	@23 50
I. C. Charcoal Roofing 14x20		—	@ 6 90
ZINC.—			
By the Cask		—	@ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask		—	@ 10
NAILS.—			
Assorted Sizes		4 00	@ 4 15
QUICKSILVER.—		@37½	41
By the flask		—	@ 1 25
Flasks, new		—	@ 1 05
Flasks, old			

GIANT POWDER,

Manufactured under Alfred Nobels' original and only valid Patents for Nitro-Glycerine Powders, which has been and still is of such immense advantage to the Miner, Railroad Man and the Engineer. All other Nitro-Glycerine Compounds, for instance, so-called Hercules, Vulcan, Vigorit, etc., are simply imitations and adulterations of the original Giant Powder.

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Manufacture three grades of Powder, which are the Safest and Strongest High Explosives in the market. The Original Nitro-Glycerine Compound

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IS A BLACK POWDER OWNED AND MANUFACTURED BY THE

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"RED CROSS," (Single Ply),
"PARAGON," (Double Ply),
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Prepared mildew-proof, and superior to the best Rubber Hose for durability and strength. CAN BE PUT AWAY FOR YEARS, AND THE STRENGTH NOT IMPAIRED. Makes the best deck hose for steamers or mining purposes yet made, and in use by all the principal City Fire Departments, New York City having 70,000 feet in active service. Also,

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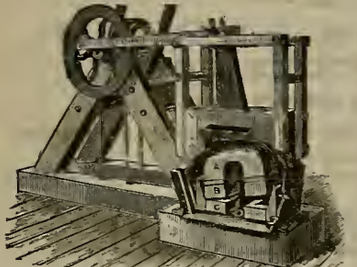

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Embracing the latest and most Improved Machinery and Processes for Base and Free Ores.

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For both Galena and Copper Ores of the Most Improved Construction.

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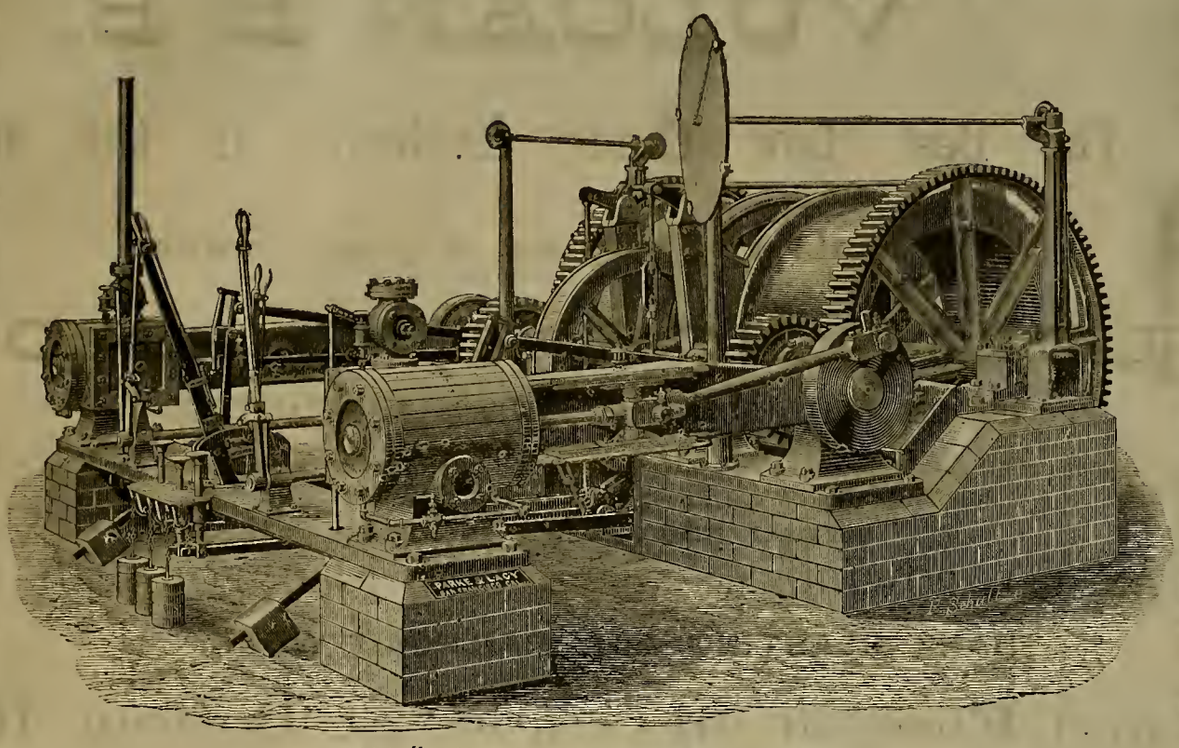

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DEWEY & CO.'S

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[ESTABLISHED 1860.]

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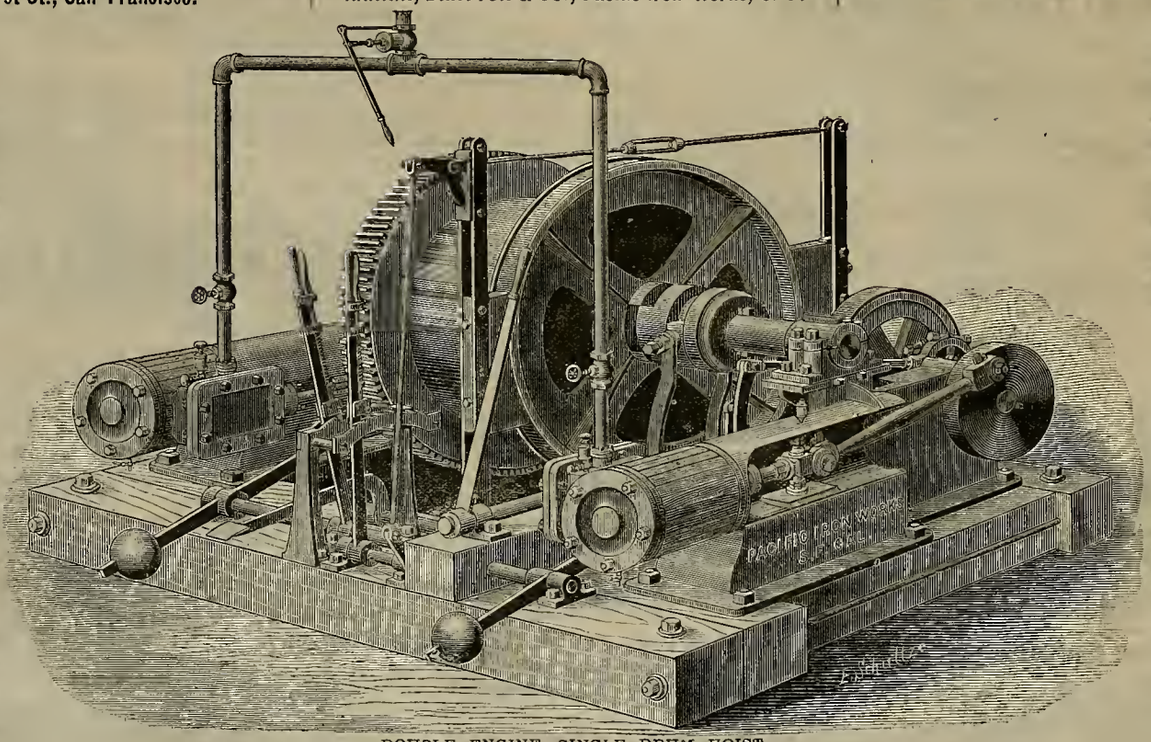


DOUBLE ENGINE, SINGLE DRUM HOIST.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, FEBRUARY 4, 1882.

VOLUME XLIV Number 5.

Separating Gold, Silver and Copper from Lead.

In separating the gold, silver and copper from lead or base bullion, the practice is to melt the bullion in a suitable kettle and then add zinc thereto, forming thereby an alloy, which is richer in silver than the original bullion, and which is separated therefrom when the contents of the kettle are sufficiently cooled down for the alloy to solidify.

To effect the desired cooling the custom has been to draw the fire from beneath the kettle, to allow the latter to gradually cool down to the desired degree. This is a tedious operation, requiring several hours, and sometimes, in warm weather, even a day or two.

To provide an improved mode of separating the richer metals in question from the lead in base bullion, and that separation may be effected more speedily and with the use of a smaller amount of zinc than has hitherto been necessary, is the aim of an improvement devised by A. H. Meyer, of St. Louis, Mo., this consisting in chilling the molten bath only, meanwhile maintaining the application of heat to the exterior of the kettle.

In the engravings, *A* represents a kettle supported on the walls, *a a*, and heated by means of a fire beneath all in the usual manner. The base bullion is softened and tapped into the kettle, and the zinc added thereto. Then, to effect the cooling, a pipe, or system of piping, *B*, is, by means of the cord, *C*, and pulleys, *c c*, lowered into the molten bath, bringing the piping preferably very near the bottom of the kettle.

Hose connections, *D D*, are made with the piping, and water is sent through it, flowing in at *D* and out at *D*, and as indicated by the arrows. Any air in the pipes can be let out by means of the cocks, *E E*.

The flow of water, as described, causes the contents of the kettle to be rapidly chilled; in practice, not requiring over 15 minutes to cool the molten metal to that degree at which the zinc-silver-lead alloy solidifies.

This occurs at first in that portion of the bath which is in the immediate vicinity of the piping, the alloy collecting about the piping, together with some of the base bullion. The piping is then swung around in the kettle, so as to come in contact with all parts of the bath, bringing the piping into a position at right angles to that shown in Fig. 2, and into any desired intermediate position.

As the alloy and the base bullion upon the piping come in contact with the hotter base bullion, which occurs as the piping is turned around, the base bullion that has hardened upon the piping melts off and the alloy floats upward to the surface of the bath, where it is collected.

A special advantage derived from curving the pipes and carrying them down to the lower part of the kettle, as shown, is that thereby the molten bath is cooled down evenly. Formerly when the metal was allowed to cool by radiation, the surface of the metal cooled down in advance of the metal at the bottom of the kettle, and in consequence it required, in practice, a larger amount of zinc to separate the alloy than by the present mode, and a portion of the alloy also adhered to the shell of the kettle. Although the principal portion of the zinc is eventually regained, any increase in the amount necessarily increases the expense of the operation.

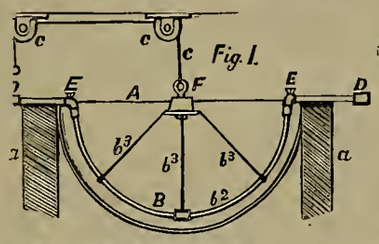
The rods, b^3, serve to brace the piping, to connect it with the cord, *c*, and also to support weight, *F*, which is used to keep the piping down in the kettle. The piping, *B*, which might be in the form of a hollow-flattened tube, or in any other shape suitable for carrying the water current through the liquid metal for the purpose described, is preferably in the form of the winding pipe shown.

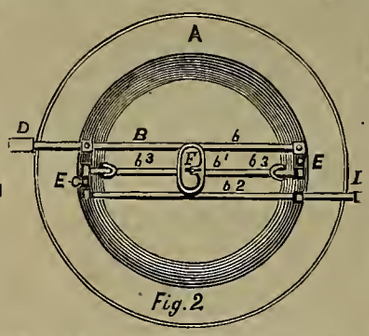
It is desirable, however, for the piping to be so constructed as to have an excess of cooling surface at the lowest part of the kettle, for in the present operation the fire is constantly maintained beneath the kettle, keeping the shell of the kettle warm and preventing the adherence of the alloy thereto; and hence, if the cooling surface of the piping were evenly distributed throughout the kettle, the molten bath would be overheated at and near the bottom thereof, and this difficulty would be increased by the radiation from the surfaces of the bath.

A New Door-Knob.

A large manufactory has been established in the East, which makes door-knobs of all variety of patterns on the principle shown in the accompanying engraving. From Geo. V. Blackman, the agent for this coast, 912 Broadway, Oakland, we learn that the knob is received with great favor in this city and Oakland, and wherever he has brought it to the attention of architects, or other experts.

As will be seen by the engraving, the spindle is threaded on one end, and fits into an internally-threaded slide-nut having a square head.





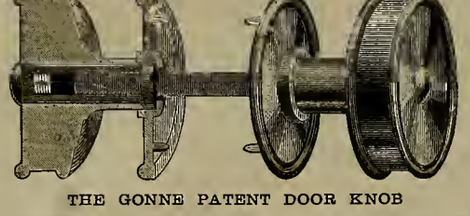
APPARATUS FOR SEPARATING GOLD, SILVER AND COPPER FROM LEAD.

In the end of the knob which fits into the threaded end, is a square socket fitting on to the head of the slide-nut. After the spindle has passed through the door (the rosse being held in place by the lugs cast on them), the slide-nut is screwed up by the end of the slide-nut fitting into the square socket of the knob. Then the roses are solidly held in place and the slide-nut is screwed up to a shoulder formed in the rose, as shown.

When this slide nut is screwed up tight, one knob and the spindle are held in place. The slide-nut is then turned so that the neck of the knob (socketed square inside) will slide over it and keep it from turning either one way or the other. A screw on the end keeps that knob on, and the knob keeps the nut in place, so the knob is then ready for use.

In this way the knobs are easily and accurately adjusted to any thickness of door, and no screws are used in the necks to secure the knobs to the spindle, the screw going through the end of the knob, and being large enough to be serviceable.

No screws are used in the roses, as the knobs are adjusted so the roses cannot become loose. No adjusting washers are used. The knobs cannot be pulled off, and are durable and simple in construction. In this there is a continuous bolt from outside to outside of each knob through the door, with a head on each end.



THE GONNE PATENT DOOR KNOB

ELEVATOR SAFETY BRAKES.—There are about 500 passenger elevators in New York, and among the passenger and freight elevators in the city and neighborhood, one wire rope breaks on an average each week, and a car is caught by the safety brake without accident. It is many years since a car missed its hold and fell to the bottom.

THE dividends of the Ontario, U. T., now foot up $3,950,000.

Discoverers of Mineral.

The case of Orion vs. Pendery was decided a short time ago by Justice Millar in the United States Circuit Court at Denver in favor of defendant. The Orion had been first located; but the Pendery, located subsequently on the same territory, discovered mineral in place before the discovery by the locators of the Orion claim.

Justice Millar, in delivering the opinion of the Court, said that the question submitted to the court is this: Can prospectors on the public mineral domain acquire any right in which the law will protect them prior to the discovery of mineral in rock in place; and if so, can plaintiffs, being prior locators, recover against defendant, who first discovered mineral on the ground in controversy? It is the opinion of the court that, inasmuch as the plaintiffs allowed the defendant to enter upon their claim and within their boundaries, and there sink a shaft in which he discovered mineral in rock in place before a discovery by plaintiffs, and make a location therefor, without protest, the defendant now has the better right. But the plaintiffs might have protected their actual possession of the entire claim by proper legal proceedings, prior to the discovery of mineral by the defendant or by either party. A prospector on the public mineral domain may protect himself in the possession of his *pedis possessionis* (foot-possession, so to speak) while he is searching for mineral. His possession so held is good as a possessory title against all the world, except the Government of the United States; but if he stands by and allows others to enter upon his claim and first discover mineral in rock in place, the law gives such first discoverer a title to the mineral so first discovered, against which the mere possession of the surface cannot prevail.

IN the Cababi district, Arizona, Indians are employed in mining. Recently, under the advice of a chief, they struck for 25 cents per day extra. They were receiving $1.25, and clubbed together for a raise of the extra quarter. They held out only one day and then went in at the old rates.

THE Northern Pacific, in the spring, will have one or more light-draft, powerful steamers on the Yellowstone, and will utilize the river for moving forward to Coulson iron and other material for track-building east and west to that point. A locomotive and flat-car will also be hauled up from Miles by the same method.

Hydraulic Gravel Elevator.

When the Hydraulic gravel elevator was devised by Mr. Cranston, a good many people were certain that it would not work. Miners, however, who had claims with gravel so low it would take expensive tunnels to bottom it, or who wanted to lift their gravel to get fall, felt that if this machine would work at all, it would be an extremely useful appliance, and that with it many claims could be worked which would otherwise be useless. Mr. Joshua Hendy, the well-known manufacturer of mining machinery in this city, took hold of the machine and brought its merits more prominently before the public, having confidence in it from the first.

The elevator is now in use in many mining claims on this coast. Giving it the requisite amount of water, it seems to give satisfaction. There are some points about it, however, not generally understood and, in fact, very few experiments have so far been made. A correspondent of the PRESS, who has been experimenting with the elevator for some time, writes us the following as rules for conducting and operating hydraulic gravel elevators: EDITORS PRESS: Allow me to call your attention to the following rules in connection with hydraulic gravel elevator:

1. Determine how high the water and debris is to be raised.
2. Allow 100 ft. of pressure to every 17 ft. of elevation to be made with the machine.
3. Determine the amount of water available for supplying the machine.
4. Determine the size of the nozzle to be used.
5. Multiply the diameter of the nozzle by three for the diameter of the throat of the elevator.
6. Multiply the diameter of the nozzle by four for the diameter of the discharge pipe.
7. Make the area of the opening at the base of the elevator the same as that of the discharge pipe.

The theory indulged in by hydraulic-elevator men, that it does not make any difference how large the discharge pipe is, I have found to be a mistake. That it will not hold good, I will convince any gentleman by actual demonstration, who will take the trouble to call at my residence, 867 Chester St., West Oakland.

The value of these elevators for pumping and raising sand, gravel and bowlders as large as will pass through the elevator is comparatively unknown, and is deserving of more attention from mining men than it has yet received.—ELEVATOR.

We hope if any persons who have been using the elevators have any further practical suggestions to make in this connection, they will make them public. A discussion of the subject will be useful, as the appliance is a comparatively new one, and any observations concerning it will be read with interest.

THE DEBRIS TRIAL.—The Gold Run debris trial, which has been going on at Sacramento for two months past, has, as far as taking testimony is concerned, been brought to a close. The case has been adjourned to Feb. 28th, when the arguments will be commenced. The Placer *Herald* says: "These, it is estimated, will occupy seven days, and the court is not likely to render its decision until a month, and possibly more, after the trial is finally concluded. In the meantime, it is reasonable to suppose that further litigation on the question will be stayed. But should the decision, when it does come, be in favor of the farmers, we may look for such a storm of injunctions against hydraulic miners as never before fell upon the heads of the prosecutors of an important industry. But should the decision be in favor of the miners, and this seems highly probable, judging from the character and weight of the testimony, what will happen then? Virtually nothing. The lawyers will have reaped a large fee at the expense of partisan interested."

Roasting Pyrites.

Chambers for condensing the fumes obtained hy roasting arsenical pyrites and sulphurons pyrites are ordiuarily construoted of hrick, the roof, which is of considerahle thickness, heing formed entirely of brick covered with stone, and the interior of said chambers heing divided hy transverse walls into compertments, whicb communicate with each other hy means of openings in the said transverse walls, the openings heing so arranged relatively to each other as to cause the fumes in passing through the said chambers to take a zig-zag course. Chambers thus constructed are not durable, the combined action of the sulphur contained in the fumes passing through them, and of rain which enters the roof at the interstices caused hy contraction and expansion rapidly destroying the materials of which they are huilt. The said chambere also act very imperfectly, owing to the retention of heat hy the said materials, much of the arsenic contained in the fumes, instead of heing condensed and deposited in the chamher, is carried out therefrom and lost, or if retained, is frequently so hurned as to he useless, and part of the sulphur contained in the said fumes is also carried out, and is converted into sulphurous acid, which canses the destruction of vegetation in the neighhorhood of the said chambers.

The object of the invention of Mr. H. N. Lay, C. B., and Captain Harry Bulford, of Celetock, is to remedy these defects, and for thie purpose they huild flues in the transverse walls of the chamher, through which flues currents of air from the exterior of the chamher pass, and they cover the said chambers with a roof of iron. By these means the heat ehsorhed from the fumes is rapidly removed, and thrown off from the chamber. In order to protect the iron roof from the action of rain they erect over it a light covering or outer roof of wood, iron, or other suitahle material, leaving sufficient spaco between the two roofs to admit of the free passage of air between them, and the free radiation of heat from the inner or main roof of the chamher. In order to prevent the rapid destruction of tbe brickwork of the chamher by the expansion and contraction cansed hy tbe heating and cooling thereof, they brace the outer walls together hy means of hars or rods of iron, which they pass through the air flues in the transverse walls, in order that the said bars or rods may be kept cool and out of contact with the fumes in the chamber. By thus hracing the walls they are enahled to build them of less than the ordinary thickness, and the radiation of the heat absorbed hy them from the fumes is consequently much faciliteted. Instead of forming the walls and the interior of the roof of the chember entirely of brickwork, they in some cases form a portion of the said chambsr near the end at which the fumes enter partly or entirely of iron. By this construction of the chamher the hurning of the arsenic or part thereof contained in the fumes is prevented, the heat of the fumes heing very rapidly lowered on entering the chamher. Chembers constructed according to their invention are cheeper in first cost then those of the ordinary construction, heside hsing considerahly more efficient and durahle.—*London Mining Journal.*

The Area of Nevada.

An extra Census Bulletin, compiled hy Henry Gannett, Geographer of the Tenth Census, is received. It contains tables showing the approximate areas of the United States, the several States and their counties. The compiler says he finds that the whole contour of the country is given hy surveye whose accuracy is unquestioned, excepting from Lake of the Wooda to Lake Superior, and from Schoodic Lake in Maine to the Atlantic coast. The State of Nevada, according to this hulletin, contains 110,700 square milse. Of this area 35 square miles are rivers and smaller streams, and 925 square milee lakes and ponds, making a total water surface of 960 square miles, and a total land surface of 109,740 square miles. Half of the houndary portion of Colorado river and that portion of Lake Bigler within the State line is included in the water surface area. The land surfece area, in squere milee, of the several counties ie given ae follows: Elko, 8,000; Churchill, 6,400; Douglas, 790; Esmeralda, 5,500; Eureka, 4,500; Humholdt, 18,000; Lander, 6,700; Lincoln, 19,000; Lyon, 450; Nye, 24,000; Ormshy, 180; Roop, 5,200; Storey, 470; Washoe, 1,150; White Pine, 9,400. It will he oheerved that Humboldt, which is the third county in eize, is 100 times ae large ae Ormsby, which is the emallest county in the Stete. Roop hae no organiztion and is attached to Washoe for judicial and other purposes. Thcre are 11,520,000 acres of land in this county.

F NEW VOLUME.—The MINING AND SCIENTIFIC PRESS commenced Vol. XLIV with ite issue of January 7th. The PRESS ie a complete cyclopædia of the mining evente of the Pacific slope, hesides containing iteme of interest of a general nature. It ehould he a regular visitor to every miner's cahin, ae well as to every husineee firm on the coast. May it continue long in its field of usefulnesa.—*Esmeralda Herald.*

OF the 580 etampe operated by the Homeetake company, Deadwood, 280 have heen hung up, owing to lack of water, and nnleee there ie rain or wet enow soon, the others muet cease work. Nearly all of the Central mille are idle.

Four Rare Trees of Arizona.

[Read before the California Academy of Sciences, by J. G. LEMMON, Oakland, Nov. 21, 1881.]

Two Pines, a Cypress and a Sycamore.

During the present and the preceding season the writer has contrihuted to the Botanicel Museum of the California Academy of Sciences specimene of several rare or little-known trees, collected in the mountains of Arizona, and which, for want of time or strength, have heen presented almost without comment.

Agreeahle to the request of several memhers of the Academy, an attempt will be made in this paper to give some points of presumed interest concerning a few of these trees.

But, first, it is necessary to assert, in the hearing of the ordinary traveler, that there are trees of any kind in the arid territory of Arizona. This consideration prompts to a few words of general description.

Arizona Territory comprises a large crosesection of that hroed interior region hetween the Rockiee and the Nevadas that is often miscalled the Great Basin. This region is characterized by areas of desert land, so-called, undulating plains of white or reddish sand, epacsely dotted with shruhs such as creosote bush, mesquite, palo verde, acacia, etc., plents that thrive with little water and that love the sun. Also, thie is the home, *par excellence*, of the cacti, of all forme end sizee from the little pincushion to the large and statsly tree cactus.

Rising out of these plains are bald mountains of many hues and shapes in accordance with their rock composition. Some of thsee mountains are disposed in long parallel chains, especially those in the north end of the Great Basin and mostly included in the State of Nevada. Southward in Arizona the mountains are generally so deeply submerged with send and gravel, the hed of a recent vast inland sea, that only a few of the most elevated peaks remain uncovered. Theee peaks are thus move or less isolated and separeted hy wide etretches of arid desert, and this isolation inevitahly leads to the production of peculiarities of its products, especially to differentiation and verieties of floral objects. As most of these mountains are not high and are but a few miles in circuit, with no living springs in them, their flora ie limited to dry-weather vegetation and such ennuale as are nourished hy the rains and coolness of a short winter and the few days of rainy eeeson in midsummer. It will he many years before hotanical exploration on this coast will be conducted so thoroughly as to comprise a complete knowledge of all tbe pecnliar plants that are annually spreading their petals to the sun ou those lonely mountains and telling to the untutored aborigines the etory of their mysterious origin, and revealing to his dull eyee the beauty of their peculiar forms.

Other Higher Mountains

Are usually found disposed in chains of several miles in length.

These chains are the more distinct vestiges of great suhmerged ranges that traverse the whole region parallel with the great Rocky end Nevada renges. These high chains are often of considerahle hreadth, and their outlying peaks frequently enclose valleye of great fertility, which are usually well forested on the north slopes as well as on the floors of the valleys, if high enough to he cool and well watered. In fact some most delightful parks have heen discovered, almost ineccessihle, fenced round with hristling peaks and upheld close to the sky and the stars.

It is in these alpine valleys and slopes that most of the new things are fonnd, the descriptions of which are fast appearing in hotanical journals at the East.

As stated in a former paragraph, many of the

Trees of our Great Sierra and Coast Ranges

Are found also on the highest mountains of Arizona. In several localitiee lumher factories heve heen in operation for yeers. An especially rich valley of pine timher is located in the Chiricahua monntains, utilized hy a large factory, which for years hae empplied the market of Tombstone.

Large plateaue of good timher are crossed hy the line of the Atlantic & Pacific R. R., near the middle of Arizona, on the parallel of 35°.

Theee forests are composed priucipelly of *Pinus ponderosa*, Douglas spruce and white fir, with several species of oak. Among theee trees, or apart from them, on the highest peake are found the rare and little known treee to he decrihed.

No. 1.—"Charles Wright's Sycamore."

Platanus Wrightii, Wateon—The eycamore is a small genue of hut six epecies; the only genus of the order of *Platanacea*, or broad-leaved plants; found only in the northeru hemisphere—two speciee being in the Levant, one in north Africa, one in the Mississippi valley, and along the Atlantic sea-hoard; a fifth epecies is found growing in the banke of lowland streams in California and Oregon, while a sixth very distinct species has lately heen detected ae growing along the lower washee of certain etreame of Arizona.

The eycamore ie alwaye a etriking ohject from its uenally very large eize, the smoothnees of ite bark, the epidermie heing removed annually, the great eize of its many lobed leaves, and the eingularity of its hutton-hall fruit hanging down on long pednncles. The Eastern species, *Platanus occidentalis*, is the largeet, though not the talleet tree in the United States, east of the Sierra Nevada. Specimene have been measured, in the hottom lands of the Ohio, that are 40, and even 50 ft. in circuit; more than 13 ft. in diameter.

Onr common California tree, *P. racemosa*, has never heen found so large, the largest measurement heing reported from near Los Angeles, of trees over 29 ft. in circumference. The new Arizona epecies is not a large tree—only 10 to 15 ft. in circumference—while much more of the epidermis remains on the trunk thau in other epecies. In other respects this tree differs most from the other two United States speciee in characters of the leaf and fruit. The leaf of the Eastern eycamore is very large, often 18 inchee to two ft. wide, and sinuate-lohed into three to five large divisions. The fertile ament is globular, ahout three-quarters of an inch through, and is eolitary upon a long, string-like peduncle.

The leaf of our California eycamore is smaller, very variahle, as regarde the number of lohes, usually five-lobed heyond the middle, densely tomentose when young, with white or rusty short hairs. The hutton-halls are about an inch in diameter, arranged in numhere varying from two to seven along a moniliform or necklace-like spike, which depends among the leaves.

The leaf on mature trees of the new species from Arizona is smaller, very acutely and deeply, 5 to 7-lohed with a little tomentum beneath. The lower lohes project hackward, and form a deep sinus around the long petiole, 2 to 5 inches. The raceme of fruit is equal to the length of the leaves, end is composed of three halls of about three-quarters of an inch in diameter.

History.

It appears that Charles Wright first collected specimens of this tree while on the survey of the United States and Mexican houndary in 1851–2, but not until recently was a careful examination given to the specimens, together with othere collected by later hotanists, hy Prof. Sereno Watson, at the Harvard herbarium. He found characters decidedly distinct from all known species, and published a description in "Contrihutions to American Botany," issued April, 1875.

We found *Plantanus Wrightii* eparsely along the streams flowing out of the Santa Catalina mountains north of Tucson, the Santa Ritas south of Tucson, the Patagonia mountains, on the Mexicen houndary, and especially fine trees, seemingly entirely at home in the Chirricahua mounteins, some in the north end of the range near Dos Cahases, others near the south end in Rucker valley.

No. 2.—"New Arizona Pine."

Pinus Arizonica, Engel—The pine family comprises a large numher of the most useful trees on the earth; justly entitling the family to the appellation recently given to it of "the heneficent pine."

There are found throughout the globe nearly 70 epecies of pine, 11 of which are in the Atlantic States, and 19 in the Pecific States, 7 of which are in Arizona. Not one of the Atlantic species extends to our division, and vice versa. Three of the Arizonians, however, are the most common species of California, namely, *Pinus monophylla*, Tor., *P. contorta*, Doug., and *P. ponderosa*, Dong. Two of the others, namely, *P. edulis*, Engel., and *P. Chihuahuana*, Engel., are found also in Mexico, and are hut little known, while the two remaining, *P. Arizonica*, Engel., and *P. reflexa*, Engel., have but lately heen discovered in Arizona and are, perhaps, local species limited to a few peaks.

Pinus Arizonica was first detected hy Dr. J. T. Rothrock while with Lieut. Wheeler's expedition through the horder Statee in 1874. He found a north ravine of the Senta Rita mountains, 40 miles south of Tucson, partly clothed with a kind of pine closely resemhling small trees of *Pinus ponderosa*, our common yellow pine eo ahundant iu the Nevadas; hut his tree hore its leaves in fasciclee of *fives*, instead of *threes*, as in the *ponderosa*. This aroused his suspicion, and he forwarded his specimens to Dr. Engelmann, with the remark that this trec was "the hest lumher of that region, end there called yellow pine." Dr. Engelmann eeized upon ite meager differences, and at once announced a new species, hut admitted that it hore too many charactere of *ponderosa*, and also some of a Mexican epecies, *P. Montezumæ*. It remained for other hotanists to gather other specimens from other peaks, and finally, for Dr. Engelmann himself to make a pilgrimage last Septemher to the original locality, and rceeive confirmation through hie own eyes of those wonderful deductions which the mastere make in their closets, hased upon fragmente of plants sent them by field hotaniets.

We firet met with the *Pinus Arizonica* on the summit of Mt. Graham, at an elevation of ahout 10,000 ft., and as a component part of a thin forest of pine, spruce, fir and juniper, forming a lovely open park on the mountain top. Thie was in August of '80. Dr. Engelmann declared the specimeue were very satisfactory, and rather etrengthened the supposition of distinctness. In Septemher, Prof. Sargent, of the Census Bnreau of Foreetry, with Drs. Engelmann and Parry as aseistante, arrived on this coast, and the two firet-named gentlemen went down to Arizona and with much effort climbed up into the Santa Rita mountains, to the altitude of 7,000 ft., found abundance of the pine in question, and hecame confirmed in the conviction that it was indeed a new species.

During the present year it has been collected in several localities, widely removed. In April, Mr. Priugle, employed hy Prof. Sargent, thoroughly explored the Santa Rita mountains, making full specimens of the *Arizonica*, its hranchee, cones, cross-sections of timher, etc., to he deposited in a New York museum.

In May, we found the puzzling tree sparsely inhahiting the deer park on the summit of the Santa Catalina mountains, mixed with a form of *ponderosa*, that also hore leaves in fascicles of fives. This led the writer to douht tbe distinctness of this species, and ceused him to desire to see it in still other localities. The wish wes gratified fully a few weeks after, when hotanizing the lofty range of Chirricahua mountains, in the extreme southeest portions of Arizona. In the little valleys on the north side of the highest peaks of thie nohle range, was growing this remarkahle pine, along with its usnal companion, the *ponderosa*. Here the diffsrencee were decidedly more marked. The *Arizonica* is always smaller, with darker hark hroken into smaller plates, glaucous-green hranchlets, and with shorter, narrower leaves, alwaye in fascicles of fives. In vain we sought for ahherant forms of thie species, or of the *ponderosa*, heside it. They certainly appear very distinct in this locality, despite the similarity of the coues, etc.

Both species have many features in common with four-fifths of all known pines, and forming the large eection called *Pinaster*.,

From the other emall section, *Strobus*, the first section ie distinguiehed as heving the conescales generally thicker, the upper exposed portion called the apophysis having a dorsal tuhercle called the umho, which is generally armed with a prickle; leaves 1 to 5 in a fascicle, their eheaths usually persistent; wood generally harder, heavier, and more resinous.

Characters Compared.

The ealient and seemingly distinctive characetere separating ponderosa and Arizonica may he thus compared:

Pinus ponderosa—A large tree, often 15 to 20 feet in diameter, with usually yellowish, grayieh, or reddish-brown berk, sometimes quite derk, generally divided by longitudinal fissures into large plates; cones often very large, 6 to 8 inches long; hrenchlets hrownish green; leaves usually long, 10 to 15 inchee, large end etrong, normelly in fescicles of threes. The species is of wide renge, from Alaska to Mexico, end eestward to the Rocky monntains. It is aleo exceedingly variahle.

Pinus Arizonica—A small tree not exceeding four ft. in diemeter, with dark, finely divided hark; small cones, 3 to 4 inchcs in length; gleucous-green hranchlets; leaves, 4 to 8 inches long, very elender, week, in fasciclee of fives. These characters are constant eo far as detected.

The only absolutely iuvariable distinction hetween the species is microscopic and was detected hy Dr. Engelmenn. He discovered that *Ponderosa* has the strengthing celle of the leaf near the epidermis and elso *around* the few longitudinal resin ducts, while *Arizonica* hae *none* around the ducts.

At two localities in Arizona thie *Pinus Arizonica* ie sufficiently ahundant and at so low an altitude, 7,000 to 10,000 ft., as to he ohtained hy lumhermen, who have erected factoriee and have manufactured considerahle quantities of lumber annually. Of course this lumher is not so free from knots ae are the immense, tall, limhless pines of our royal Sierra, hut as the timher is hard and durahle it serves many useful purposee in the mining and huilding enterprises of that fast growing community.

Principal Localities.

One of these localities is that so often alluded to in this paper—the large canyon coming out of the north eide of the Santa Rita mountains, where the specimens were first collected by Dr. Rothrock. A factory erected there eeveral years ago euspended operations only a few months ago, when the progress of the S. P. R. R. hrought our euperh Truckee lumher into Tucson at much less cost.

The other locality is in the distaut Chiricahua mountains, spoken of, wbere is found a deep, well-forested valley, or rather a broad canyon coming out of the north side of the highest peaks of that lofty range. A lumher factory there of eeveral saws is still ectively employed in getting out hoarde, planke and square timhere for the minee and buildings at Tombstone and vicinity. The principal treee of thie valley are *Pinus ponderosa* and Douglas spruce, hut treee of the new speciee are not unfrequent, and ere often of the largest size.

[TO BE CONTINUED.]

A DIFFERENCE OF SIX DEGREES.—The temperature of the water flowing from the mouth of the Sutro tunnel is hut 114° Fahrenheit eince the hydraulic pump at the Comhination ehaft hae heen running hy water and the cold stream added to tbe flow, whereas hefore it wae 120°. The air temperature has heen lowered in proportion.

NEW VOLUME.—The MINING AND SCIENTIFIC PRESS with ite iseue of January 7, 1882, hegins Vol. XLIV. The PRESS contains at all times reliable information concerning the mining and manufacturing intereste of thie coast, heeides items of intereet to all claeses. It hae our eincere wishee for its future euccess. May its shadow never grow lese.—*Lewis* (Nevada) *Herald.*

THE total nnmber of stamps in operation in Snmmit Valley district, M. T., ie 221, and the total capacity of the emelter is 220 tons.

MECHANICAL PROGRESS.

The Dephosphorizing Process an American Invention.

By a recent decision of the Commissioner of Patents of the United States, the priority of invention in what is known as the basic process for dephosphorizing iron, concerning which numerous references will be found in the back numbers of the *Manufacturer and Builder*, has been awarded to an American inventor, Mr. Jacob Reese, of Pittsburg, Pa. This decision will attract widespread attention and discussion from the importance of the interests that will be affected by it.

The basic process, by making available for the production of steel, pig irons high in phosphorous, which have hitherto been quite useless, promises to immensely extend the utility of the Bessemer process, and many metallurgists have not hesitated to pronounce it to be next to the Bessemer process itself, the most important discovery in siderurgy of modern times.

The decision referred to will not only deprive Messrs. Thomas & Gilchrist, the English metallurgists who have hitherto received the credit of the invention, of their rights to ownership in it in this country, but will also, very likely, give rise to serious complications of a business nature, from the fact that a "syndicate" of American Bessemer steel manufacturers has already purchased for a large sum the right to use the Thomes-Gilchrist patents, the most important of which have now been declared invalid. The effect of the decision on the introduction of the basic process here will only be developed by time. Meantime, Mr. Reese, who has come victoriously out of a severe struggle for his rights, is to be congratulated for his victory, won in the face of the severest opposition and discouragement.

As a significant fact in connection with Mr. Reese's present position, it is said that when at the meeting of the American Institute of Mining Engineers, in May, 1879, at which Prof. Maynard read a paper giving the first description of the Thomas-Gilchrist process, Mr. Reese arose and laid claim to having been the prior inventor of the process, his remarks were received with general mirthfulness. His victory in the face of this notable evidence of incredulity is all the more creditable to him.—*Manufacturer and Builder.*

PROTECTION FROM EMERY-WHEEL DUST.—One of the most common objections to the use of emery wheels is the inhaling of the dust arising from their use, as well as the particles of metal cut from the pieces being operated upon. This is but little more objectionable than the injury to the eyes from the presence of these same foreign substances. In Germany, masks are made of mica, that entirely cover and protect the face, and from which an air tube is carried around between the shoulders, where it is provided with a mouth-piece filled with a saturated sponge, through which the air supply is drawn. The mica is transparent, and not easily broken. In this country exhaust fans are sometimes used to carry away the dust-laden air, inducing a constant current of fresh air to take the place of that removed by the fan. This alone is not a protection against particles of considerable size that are liable to strike the face with violence, often seriously injuring the eye. It would seem probable that a combination of the two plans might work very satisfactorily.

KEEP YOUR BOILERS CLEAN.—Concerning cleanliness of boilers the *American Machinist* says: If dirty water is used in boilers of any kind, they should be frequently washed out. If they require it every week, it should be done. We remember an instance some months ago where a set of tubes were greatly damaged and several of the bottom rows burned out by reason of the dirt within the boiler. They were repaired, and the same thing occurred again. Finally, the suggestion was made to wash the boilers once a week if they were dirty, which suggestion was carried out, since which time there has been no trouble from that source. It has also been noticed that the valve seats and cylinders are not scratched as much as previously, and the boilers steam very freely, which, of course, reduces the coal consumption. Boilers should be always washed when they are dirty.

GOOD MECHANICS DO NOT "BLOW."—The true mechanic is not a blower. One may ride for hours in the cars, where all classes commingle, and it requires the closest scrutiny to detect the practical mechanic or call out his specialty. One of the pleasantest companions the writer ever met on the railroad sat and talked on several subjects, with a freedom not usual and with an intelligence uncommon, for nearly three hours, before the writer ascertained he was a mechanic, a machinist. The facts he cited, the arguments he suggested, the plans he commended, would have been valuable to a Congressman or a public speaker; and yet he never obtruded his business, and it was ascertained only when brought out by a direct question. And then the fact was elicited that this man was a very thorough mechanic, whose name, if mentioned, would be recognized by most readers.—*Boston Journal of Commerce.*

MACHINERY AND MECHANICAL SKILL.—The wonders of mechanism, says the Boston *Journal of Commerce*, have furnished material for essays, anecdotes, sketches, for lectures and lessons without number. The close imitation of sentient human judgment by insensate material when formed into acting machinery; the microscopic wonders of production in watch-making machinery—screws so small that to the unaided eye they appear like grains of minute seeds—the automatic handling of metals in process of conversion from mass to individual shapes; the exact reproduction of periods of time or of acts by machines which count, and register, and measure, and return: all these are admirable and admired. But the skilled workman makes possible the wonder-working machine. He must first make the initial screw, the first wheel, form the first gear tooth, lay out the first categories of levers, inclined planes, rotating wheels, and reciprocating movements that make a completed machine. It should always be borne in mind that the machine never improves itself; it is simply a reproducer; and even to continue to be a reproducer it must have its own waste supplied and re-supplied by continual additions made by the trained hand, backed and guided by the intelligent brain. So, when we are inclined to argue the progress of the race by the achievements of machinery in our day, let us never forget that these achievements are not only primarily the outgrowth of individual human skill, but must also be kept up to their present standard by individual human skill; and that no progress whatever can possibly be made without the perpetual presence and active operation of the skill of the individual workman.

APPLICATION OF FAURE'S ACCUMULATOR.—At Vienna, two engineers are said to be engaged in fitting up works for producing immense quantities of electricity by the hydraulic power of the Danube. This electricity is stored up, in accordance with Faure's method of accumulation, in boxes of various sizes, and supplied to manufacturers and tradesmen for the purpose of lighting and working machinery by electricity. Despite the immense cost of the plant and the very low price at which the fluid is to be sold to the public, the inventors expect to derive an immense profit from their work, and therefore to find capitalists to back them up to any extent. Besides storing electricity in boxes, it is intended to convey it by means of cables sunk in the ground. By a combination of both methods, storehouses of electricity are to be established in each district at Vienna, so that manufacturers, shop-keepers, sewing machine workers, etc., need but just take their boxes to the depot to have them filled with electricity in one or more days, according to the circumstances of the case. At the central works it is intended to make an immense shaft transmit the hydraulic power of the river to the shore, and there to produce the desired speed by means of multiple transmissions. To guard the hydraulic machinery from the effects of frost and ice, the gigantic shaft is to be laid down considerably below the level of the river; by this means the ice is prevented from touching the circumference of the water wheel even in the severest frost of winter. It is further contemplated to provide immense ice-breakers, to prevent the injurious effects of drifting ice.

NEW METHOD OF INLAYING WOOD.—A new method of inlaying wood has been contrived by a furniture manufacturing house in England. The process is as follows: A veneer of the same wood as that of which the design to be inlaid consists—say sycamore—is glued entirely over the surface of any hard wood, such as American walnut, and allowed to dry thoroughly. The design is then cut out of a zinc plate about one-twentieth of an inch in thickness, and placed upon the veneer. The whole is now subjected to the action of steam, and made to travel between two powerful cast-iron rollers of eight inches in diameter by two feet long, two above and two below, which may be brought within any distance of each other by screws. The enormous pressure to which the zinc plate is subjected forces it completely into the veneer, and the veneer into the solid wood beneath it, while the zinc curls up out of the matrix it has thus formed and comes away easily. All that now remains to be done is to plane down the veneer left untouched by the zinc until a thin shaving is taken off the portion forced into the walnut, when the surface being perfectly smooth, the operation will be completed. It might be supposed that the result of this forcible compression of the two woods would leave a ragged edge, but this is not the case, the joint being so singularly perfect as to be unappreciable to the touch; indeed, the inlaid wood fits more accurately than by the process of fitting, matching and filling up with glue, as is practiced in the ordinary mode of inlaying.

HOLLOW STEEL SHAFTS FOR STEAMSHIPS.—Hollow steel shafting has been in use in Europe for some little time; but it is only quite recently, we believe, that this principle has been applied to such heavy work as steamship shafts, which has quite recently been done by Whitworth & Co. On this system, a 10-inch shaft has a hole four inches in diameter, reducing the weight 16%, while the strength is only diminished by 2.56%. With a 5-inch central hole, these figures would be 25% and 4.25% respectively.

SCIENTIFIC PROGRESS.

Artificial Cultivation of Sponges.

Some time ago attention was called to the fact that several Austrian scientists had demonstrated the feasibility of artificially propagating sponge by actual experiments in the Mediterranean, with the fine sponges that grow there. The method they adopted was simply to cut the living sponges into small pieces, which were then attached, at suitable distances apart, to a framework of wood, which, when filled, was weighted and sunk beneath the surface of the sea. These sponge fragments were found not only to retain their vitality, but to increase rapidly in size, so that a few years sufficed to produce marketable sponges therefrom at comparatively trifling cost.

In view of the rapid exhaustion of the sponge fisheries in the Mediterranean, the foregoing demonstration was looked upon as of great practical value, and the Austrian government gave official encouragement to the conduct of a series of similar experiments. These were, unfortunately, nullified by the jealousy and ignorance of the sponge fishers, who foolishly imagined that their industry would thereby be injuriously affected, and they repeatedly destroyed the wooden platforms and their contents. The experiments met with such strenuous opposition from this source, that they were finally abandoned and, have never been renewed.

We learn, however, from the *Oil and Drug News*, that experiments in the artificial cultivation of sponges have lately been undertaken, and with very promising results, at Pine Key, Fla. The pieces of sponge referred to in this case are spoken of as being simply transplanted, and not cut into small fragments as in the Mediterranean experiments. These were found to increase in size from two to seven or eight inches in diameter within the period of seven months.

The suggestion is now made to transplant the finer Mediterranean sponges and attempt their artificial propagation, and there is little doubt but that it would prove more profitable to raise them in our own waters than to import them. The superior quality of the Mediterranean sponge, however, is largely due to the extreme clearness of the water in which it grows, and much care would have to be exercised in the selection of the situation in which to cultivate it. As the possible indication of an entirely new industry, the foregoing is worthy of notice.

Solvent Action of Canned Food on Tin.

This subject has lately been carefully investigated by Helmer, who announces through the London *Lancet* that tin, even when quite pure, is much more readily attacked by canned articles of food than is commonly supposed. He has made an examination of a large number and a great variety of such canned goods, and has found tin in comparatively large quantities in nearly all of the samples examined.

As examples, he states that acid fruits, such as peaches and cherries, corrode the metal to an alarming extent; but what is even more serious, he found that meats, and even condensed milk, take up and become contaminated with sensible quantities of the metal. He instances the case of a can of soup, which he found to contain 35 milligrams (about ½ grain) of tin to the pound; one of condensed milk which carried 8 milligrams (⅛ of a grain); and one of oysters, which contained 45 milligrams (about 7-10ths of a grain) to the pound. He found also, that soda water, and all other varieties of aerated beverages which he examined, and which were conducted through tinned pipes, contained appreciable quantities of tin.

Having established the above facts, we come now to the more directly interesting and important question, whether tin is injurious to health. On this point there appears to be still some room for doubt. To settle the question, Helmer made a number of experiments upon pigs, the results of which went to prove that while *stannic* compounds are harmless, *stannous* compounds acted as decided irritant poisons. As the tin dissolved in the various forms of prepared foods would exist in this latter condition, the above statements become decidedly important.

Clover Insects.

The American *Naturalist* has a notice of a small work on the insects of the clover plant by Mr. Lintner, the State Entomologist of New York. After an introduction showing, by quotations from Mr. George Geddes, the importance of the clover crop, especially to the people of New York State, he makes manifest the large increase of insect depredators on the plant. He then remarks upon the fact that no notice of clover insects appears in the reports of Dr. Fitch, his predecessor; which fact indicates the scarcity or the unimportance of the insects affecting the crop in Fitch's time. He next quotes from Kaltenbach's "Pflanzenfeinde" a list of 66 species affecting clover in Europe, and by way of comparison gives a list of our own species, which includes 33 lepidoptera, 3 coleoptera, 3 diptera, 5 orthoptera and 2 homoptera.

The *Naturalist* says: "It may be safely assumed that the number of species in this country affecting the plant, though not perhaps injuriously, will be at least doubled by future observation, and in coleoptera we feel confident that it will be quintupled."

WILD BIRDS RACING WITH THE CARS.—Several times I have noticed wild birds of different species flying along parallel with, and near a railroad train, in such a way as to suggest the idea that they were really trying to distance the iron horse. One day last spring, I was coming East from Sioux City, Iowa, on the Illinois Central R. R., when my attention was attracted to a couple of birds, which seemed to be making us a trial of their speed with the train. They were, as I supposed at the time, our smallest species of hawks—sharp, alert, powerful birds, possessed of a high degree of strength and endurance on the wing. They kept steadily on their course, a dozen rods from the train, for at least a mile and a half; but the train was too rapid for them, and they finally turned aside and went back in the direction whence they came. A strong head-wind was blowing at the time, and the birds, at some moments, seemed to sail squarely in its teeth, without fluttering a wing. I watched them with much interest, and I did not think I could be mistaken in the belief that they were really trying to beat the train in the race. Horses and dogs frequently race with railroad trains, and possibly the instinct for sport and excitement may also exist in the wild birds. *Charles Aldrich, Webster City, Iowa.*

A CANADIAN ACADEMY PROPOSED.—At the instance of his excellency, the Marquis of Lorne, the initiatory steps have been taken for the establishment of a Canadian Academy after the plan of the Academie Francaise, which consists of 40 men selected by the body itself from among the most notable men of letters in France. Lord Lorne has already set on foot the Royal Canadian Academy of Art, which will, we hope, yet grow to be a credit to the country, although had the number of academicians been somewhat smaller, the immediate honor of connection with it would have been more highly appreciated. The proposed academy is to be composed of six sections, representing English letters, French letters, history and archæology, mathematical and physical sciences, geological sciences and biological sciences. It is probable that the membership will be limited to 10 or 12 in each section. Dr. Dawson will likely be its first president.

HERR BERNBECK calls attention in the *Pharmceutische Zeitung* to a possible inconvenience resulting from the use of ultramarine in the coloring of wall papers. He states that a room covered with an ultramarine paper was observed to be tainted by a smell of sulphuretted hydrogen, the source of which long escaped detection. Eventually, however, it was associated with the paper, and a closer examination led to the conclusion that the ultramarine on the surface was being slowly decomposed under the influence of the alum in the paste used in hanging paper. This appeared to be confirmed by the fact that a piece of paper steeped in a very dilute solution of alum gave off sufficient sulphuretted hydrogen to be perceptible to the nose and to blacken lead paper.

CORRECTING STATISTICS.—Among recent publications of the census bureau is an extra census bulletin containing tables showing the approximate areas of the United States, the several States and their counties. It has been prepared by Mr. Henry Gannett, the geographer and special agent of the tenth census. It appears that of several States a number of estimates of area have been in use, differing from one another by thousands of square miles, and none of them perhaps traceable to any authentic source; while many of the results are palpably wrong, being so far from the truth that it is a source of surprise that they were not corrected before. A map defining the gross areas of the States and Territories accompanies this useful bulletin.

INFUSORIA IN DEW.—Mr. W. S. Kent states, in his "Manual of the Infusoria," that he gathered in a very foggy day in Regent's Park a quantity of grass saturated with "dew," and found in every drop squeezed from the grass great numbers of infusoria of different genera, such as Heteromita, Vorticella, etc., with *Rotifer vulgaris* and other rotifers, and numerous Amœbæ, Anguillula, and various diatoms, the collection as a whole being indistinguishable from the ordinary microscopic fauna of a roadside pond.

A CURIOUS electrical experiment is described in one of the French journals as follows: A small pasteboard box is provided with a glass lid, which is coated on the upper surface with one or more thin layers of collodion, but not enough to render it opaque. A number of figures representing insects and the like, and made of cotton or sponge, are placed within the box. When now the collodion surface is rubbed with dry fingers in dry weather, the insects are made to move about in an interesting manner as they become electrified.

AN AMERICAN SCIENTIST HONORED.—The University of Cambridge, England, has conferred the honorary degree of Doctor of Laws upon Prof. Thos. Sterry Hunt, L. L. D., F. R. S., a native of Connecticut, who was for 25 years chemist and mineralogist to the Geological Survey of Canada, and resigned that post in 1872, to accept the Chair of Geology in the Massachusetts Institute of Technology.

STUDENTS of Kant are offered a prize of 1,000 florins for the best popular treatise on that philosopher's views on the ideality of time and space. Herr J. Gillis, of St. Petersburg, will not only give that sum, but will publish the successful essay and pay the profits on its sale to the author.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jan. 12		Week Ending Jan. 19.		Week Ending Jan. 26		Week Ending Feb. 2.	
Alpha	2	1½	1.80	1½	1.85	1.60	2	1.80
Alta	4½	4.05	4.65	4.10	5¼	4.55	5¼	5¼
Andes	80c	55c	1	80c	90c	85c	90c	75c
Albion	1½	1.60	1.90	1½	1.90	1.80	2.45	1.85
Argenta	....	....	....	....	....	....	....	....
Addenda	10c	....	10c	5c	....	....	....	....
Belcher	1.55	1.35	1¼	1¼	1.45	1.30	1.40	1.15
Belmont	65c	....	75c	....	85c	75c	8'c	70c
Best & Belcher	7¼	6¾	7¾	7¼	7¾	7¼	7¾	7¼
Bullion	1.20	85c	1	50c	90c	80c	1	90c
Bechtel	35c	30c	50c	40c	50c	35c	....	....
Belle Isle	....	....	10c	....	20c	5c	....	....
Bodie	....	2¼	2¼	2.45	4.10	3.35	3.80	3.20
Benton	75c	65c	80c	70c	1.10	70c	95c	85c
Bulwer	3.60	2¼	2.60	....	2¾	....	2.60	2¼
Boston	60c	....	50c	....	....	....	....	....
Black Hawk	....	....	5c	....	10c	5c	5c	....
Belvidera	....	....	....	....	10c	....	....	....
Booker	....	....	....	....	....	10c	....	....
Caledonia	30c	25c	30c	25c	30c	....	30c	25c
California	35c	25c	40c	30c	35c	25c	30c	25c
Challenge	50c	40c	6'c	55c	55c	....	....	....
Chollar	1.15	85c	1.10	....	1.20	1.10	1½	1.20
Confidence	3.05	2	2	....	1.95	1.85	2¼	2.10
Con Imperial	5c	....	5c	....	5c	....	5c	....
Con Virginia	90c	70c	1¼	1	1.15	1.05	1.10	80c
Crown Point	95c	90c	95c	75c	93c	75c	1	75c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	10c	....	....	....
Concordia	1	80c	95c	90c	....	....	85c	80c
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	20c	....	35c	25c	15c	....
Derbec	....	....	....	....	....	....	....	....
Day	1.65	1	1	95c	1	....	1	75c
E. Mt. Diablo	35c	....	50c	35c	50c	4'c	50c	40c
Eureka Con	13	....	14	13	13	....	....	....
Exchequer	80c	....	75c	70c	75c	65c	75c	70c
Endowment	....	....	....	....	5c	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	2	1.90	2.20	1.90	2¼	2	2¼	2
Goodsbaw	15c	....	25c	....	45c	4'c	6'c	50c
Gould & Curry	3.65	3.40	4.30	4	3.85	3.65	4	3.75
Hale & Norcross	1.35	....	1½	1.45	1.20	2.30	1.20	2¾	2.35
Head Center	....	....	....	50c	35c	90c	....	80c	75c
Hussey	....	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....	....
Julia	10c	5c	....	....	10c	5c	10c	5c
Justice	65c	55c	75c	65c	1.05	80c	1	90c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kantuck	....	....	80c	....	....	....	....	....
Kossutb	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lad Wash	5c	....	....	....	15c	....	15c	....
Leviatban	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manbattan	....	....	1½	....	....	....	....	....
Marlin White	2½	....	2¾	2¼	2¾	....	3	2.95
McClinton	....	....	....	....	....	....	....	....
Mono	80c	55c	70c	....	1.85	1	1.45	1.05
Mexican	9¼	8¾	10¾	9¼	10¼	9¼	10¼	9¾
Mt. Diablo	6¾	6½	8	7¼	8¼	7¾	8	7¾
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	15c	5c	10c	....	10c	....	30c	5c
New York	....	....	....	....	....	....	....	....
Northern Belle	8	7½	8¾	7¾	10	8¼	10¾	9¾
North Noonday	5c	....	....	....	10c	5c	5c	....
Navajo	30c	25c	50c	40c	65c	55c	65c	....
Occidental	....	....	....	....	....	....	....	....
Ophir	5¾	5¾	6¼	5¾	6¼	5¾	6¼	6
Original Keystone	....	....	....	....	....	....	....	....
Overman	1¼	90c	1	90c	1.20	95c	1.10	95c
Oro	15c	10c	1	10c	15c	10c	15c	10c
Paris	....	....	....	....	1	....	1	....
Potosi	1.40	1¼	1½	1.35	1.45	1.40	1.70	1½
Queen Bee	....	....	....	....	5c	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savaga	1.40	1¼	1½	1.35	1.60	1.30	1.70	1.60
Seg Belcher	4.80	....	....	....	....	....	4.90	4¼
Sierra Nevada	8	7¼	8¼	7¾	8¼	7¾	9¼	8
Silver Hill	15c	10c	20c	10c	25c	20c	20c	....
Silver King	19¾	19¼	19¾	19¼	19¾	19	....	....
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	95c	90c	1	90c	1	95c	1.05	95c
Solid Silver	....	....	....	....	....	....	....	....
South Bodia	....	....	....	....	5c	....	10c	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	....	....	20c	....	....	....	25c	....
Tioga Con	5c	....	....	....	15c	10c	15c	10c
Tiptop	4¾	4.70	5	4¾	4¾	4¼	4¾	4.20
Tuscarora	....	....	....	....	....	....	....	....
Union Con	12¼	10¾	11¾	10¼	11¾	10¼	11¾	11
Utah	5¾	5¼	5¾	5¼	5¾	5¼	5¾	5¾
Ward	3¾	....	3¾	....	3.60	3¼	3¾	....
Wales	75c	60c	70c	....	80c	75c	75c	....
Yallow Jacket	3.10	2¾	2.90	2.60	2.90	2.80	3	2.65

Sales at S. F. Stock Exchange.

Thursday A. M., Feb. 2.

375	Alta	200	Scorpion
250	Andes	395	Union
70	Alpha	20	Utah
200	B & Belcher	70	Yellow Jacket

AFTERNOON SESSION.

100	Belcher	500	Albion
255	Confidence	100	Bodia
125	California	50	Belding
80	Con Virginia	100	E Mt Diablo
90	Chollar	125	Eureka Tunnel
30	Crown Point	600	Goodsbaw
100	Capital	200	Head Center
100	Exchequer	200	Mono
100	Golden Gate	20	Mt Diablo
420	Hale & Nor	200	Noonday
420	Justica	200	N Noonday
235	Mexican	10	Northern Bella
210	Overman	190	Paris
1210	Savage	100	Silver King
110	Sierra Nevada	100	Wales

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Bullion, of Paradise, Jan. 28th, $1,340; Silver City, 28th, $1,306; Germania, 24th, $2,500; Hanauer, 24th, $2,100; Stewart, 24th, $4 000; Bullionville, 24th, $2,096; Horn Silver, 25th, $22 500; Hanauer, 25th, $$,100; Germania, 25th, $1,500; Horn Silver, 26th, $2,400; Hanauer, 26th, $2 000; Germania, 26th, $1,400; Horn Silver, 27th, $10,000; Bullionville, 27th, $3,-204; Hanauer, 28th, $2,150; Germania, 28th, $2,450; Horn Silver, 29th, $27,500; Bullionville, 29th, $2,109; Northern Belle, 23d, $21,814; Standard, 23d, $32,176; Silver King, 22d, $24,-000; Noonday, 17th, $6,555; North Noonday, 17th, $6,176; Contention, 23d, $9 884; Star, 23d, $3,095; Northern Belle, 26th, $6,242; Eureka, 21st and 24th, $10,647; Manhattan, 27th, $22,851; Bodie, 30th, $8,508; Star, 27th, $3,-412; Eureka Con., 26th, $3,304; Contention, $20,314.

THE coinage executed at the United States Mint during January aggregated 7,734,360 pieces, valued at $6,276,000. Of this amount there were 285,600 eagles, 556,760 half-eagles, 1,000,000 silver dollars, 722,000 five-cent pieces and 5,170,000 cents.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	15	50	Jan 6	Feb 9	Mar 2	W Willis	309 Montgomery st
Alta S ni Co	Nevada	22	50	Dec 16	Jan 20	Feb 9	W H Watson	302 Montgomery st
Best & Belcher M Co	Nevada	22	50	Jan 4	Feb 7	Feb 23	Wm Willis	309 Montgomery st
Bodie Con M Co	California	1	50	Dec 6	Jan 24	Feb 23	W H Lent	309 Montgomery st
Bullion M Co	Nevada	23	30	Jan 19	Feb 21	Mar 14	J M Brazell	328 Montgomery st
California M Co	Nevada	2	20	Jan 18	Feb 25	Mar 22	C P Gordon	309 Montgomery st
Champion M Co	California	10	25	Jan 12	Feb 20	Mar 13	B Burris	309 Montgomery st
Chollar M Co	Nevada	7	25	Jan 9	Feb 14	Mar 7	W E Dean	309 Montgomery st
Con Imperial M Co	Nevada	17	10	Jan 4	Feb 8	Mar 1	W E Dean	309 Montgomery st
Con Pacific M Co	California	4	25	Jan 28	Mar 3	Mar 27	F E Luty	330 Pine st
Con Virginia M Co	Nevada	17	30	Jan 31	Mar 11	Apr 8	A W Havens	309 Montgomery st
Day S M Co	Nevada	10	50	Jan 28	Mar 6	Apr 3	E M Hall	327 Pine st
Exchequer M Co	Nevada	18	25	Jan 12	Feb 15	Mar 6	C E Elliot	327 Pina st
Gould & Curry S M Co	Nevada	41	50	Jan 12	Feb 16	Mar 9	A K Durbrow	309 Montgomery st
Hale & Norcross M Co	Nevada	72	75	Dec 21	Jan 25	Feb 16	J F Lig btner	308 Montgomery st
Julia Con M Co	Nevada	17	20	Jan 17	Feb 24	Mar 16	H A Charles	419 California st
Mariposa Land & M Co	California	22	25	Dec 23	Jan 31	Feb 28	L Leavitt	309 Montgomery st
Martin White M Co	Nevada	11	25	Jan 20	Mar 2	Mar 30	J J Seville	309 Montgomery st
Monumental T & M Co	Nevada	1	05	Dec 30	Jan 31	Feb 21	D B Chisbolm	327 Pine St
Napoleon M Co	California	1	03	Jan 13	Feb 13	Mar 2	H Smitb	309 Montgomery st
Navajo M Co	Nevada	15	15	Dec 3	Jan 17	Feb 8	J W Pew	310 Pine st
New York M Co	Nevada	27	15	Jan 18	Feb 21	Mar 13	F E Dietz	327 Pine st
Noonday M Co	California	5	25	Dec 30	Feb 8	Mar 2	W J Taylor	310 Pine st
North Noonday M Co	California	5	25	Dec 20	Feb 10	Mar 6	W J Taylor	310 Pine st
North Standard G & S M Co	Cal	2	10	Nov 30	Feb 1	Feb 20	C V D Hubbard	310 Pine st
Original Keystone S M Co	Nevada	6	50	Dec 8	Jan 12	Feb 10	F E Luty	330 Pine st
Overman S M Co	Nevada	52	50	Jan 9	Feb 14	Mar 7	Geo D Edwards	414 California st
Rex Montis M Co	California	14	25	Jan 9	Feb 14	Mar 10	J W Ward	426 California st
Savage M Co	Nevada	49	50	Jan 6	Feb 8	Feb 23	E B Holmes	309 Montgomery st
Sierra Nevada S M Co	Nevada	71	1 00	Jan 29	Feb 1	Feb 20	E L Parker	309 Montgomery st
Spaulding G & S M Co	California	2	10	June 23	Feb 23	Mar 24	J W Pew	310 Pine st
Tioga Con M Co	California	15	10	Jan 12	Feb 16	Mar 8	W H Lent	309 Montgomery st
Tombstone Con G & S M Co	Arizona	1	02	Jan 9	Feb 13	Mar 6	J M Buffington	309 California st
Utah S M Co	Nevada	37	1 00	Jan 14	Feb 17	Mar 7	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	4	03	Dec 27	Jan 30	Feb 17	J M Buffington	309 California
Bay State S M Co	Nevada	1	02	Dec 23	Feb 6	Mar 6	J W Pew	310 Pine st
Blue Bell Con M Co	Nevada	2	50	Jan 19	Feb 24	Mar 17	H P Bush	431 California st
Butte Creek Hydraulic M Co	California	8	10	Dec 29	Feb 15	Mar 6	A L Taylor	230 Montgomery st
Con Awador M Co	California	3	50	Dec 21	Jan 24	Feb 11	F E Latham	310 Pine st
Excelsior Deep Grav M Co	California	17	25	Jan 10	Feb 14	Mar 7	D B Chisbolm	327 Pina st
Excelsior W & M Co	California	3	1 00	Jan 9	Feb 10	Mar 2	L C McAfee	328 Montgomery st
Golden Fleece Grav M Co	California	24	30 00	Jan 31	Mar 4	Mar 23	Fr Schirmier	785 Folsom st
Gopher Con M Co	Nevada	3	50	Jan 11	Feb 20	Mar 10	H Dens	309 Montgomery st
Maybelle Con M Co	California	10	20	Dec 31	Feb 7	Mar 1	W J Taylor	310 Pine st
Mayflower Grav M Co	California	14	10	Dec 30	Feb 3	Feb 23	J Morizio	323 Montgomery st
McElroy Grav M Co	California	6	10	Dec 20	Jan 24	Feb 11	L Lillie	607 Washington st
Oro M Co	California	11	15	Jan 7	Feb 13	Mar 7	W Stuart	320 Sansome st
Pinal Copper Co	Arizona	2	2 00	Jan 5	Feb 20	Mar 20	Geo T Shaw	640 Fourth st
Peabody G M Co	California	3	04	Dec 31	Feb 4	Feb 25	R D Hopkins	436 Montgomery st
Rocky Point M Co	California	10	05	Jan 13	Feb 13	Mar 6	D M Ke t	330 Pine st
Sigourney G & S M Co	California	3	03	Jan 24	Feb 28	Mar 21	A Judson	320 Sansoma st
Soutb Hite G M Co	California	3	10	Jan 9	Feb 16	Mar 7	F A Ferlin	420 Montgomery st
University G M Co	California	10	10	Dec 13	Jan 19	Feb 9	W L Oliver	328 Montgomery st
Vanderbilt M & M Co	Nevada	3	05	Jan 16	Feb 21	Mar 16	J Morizio	328 Montgomery st
Wide Awake Prospecting & M Co	Arizona	15	10	Dec 6	Jan 12	Jan 30	C Hil ebrandt	Chronicle building

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alabama M Co	——	W H Watson	302 Montgomery st	Annual	Feb 14
Alexander M Co	——	A B Cooper	328 Montgomery st	Annual	Feb 25
Bailey M Co	——	W H Watson	302 Montgomery st	Annual	Feb 14
Hil side M & M Co	Nevada	F Frankenthal	330 Pine st	Annual	Feb 14
Holmes M Co	——	E A Holmes	318 Pina st	Annual	Feb7
Humboldt M Co	——	W H Watson	302 Montgomery st	Annual	Feb 14
Maryland Con M Co	——	E P Farnswortb	219 Sansome st	Annual	Feb 6
Standard Con M Co	California	W Willis	309 Montgomery st	Annual	Feb 6
Swansea M Co	California	M A Wheeler	320 Sansome st	Annual	Feb 18
Wide Awake P & M Co	Arizona	C Hilderbrandt	Chronicle building	Annual	Feb 8

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	California	W Letts Gliver	328 Montgomery st	20	Dec 15
Bulwer Con M Co	California	W Wilts	309 Montgomery st	10	Feb 13
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Jan 16
Silver King M Co	Arizona	J Nash	315 California st	25	Jan 16
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Jan 19
Standard Con M Co	California	Wm Willis	309 Montgomery st	75 (extra)	Jan 12
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10	Jan 3
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10 (extra)	Jan 3
Western M Co	California	C S Curtiss	309 Mo ntgomery st	75	Dec 22

Mining Share Market.

Our mining stock tables show the fluctuations for the week. Explorations on the Comstock continue, but no bonanza shows itself up as is hoped for. Still there are several mines where something may show up any time.

The main incline of the Savage mine has been drained, and work has been commenced at the bottom. The raise from the 2400 level is now up about 20 ft. The water was drawn off through a hole run with the diamond drill. Before commencing the upraise, the drift from which it was to be started was run some feet north of the point where the incline will come down. From the end of this drift a drill hole was run which tapped the bottom of the incline. A close partition was put across this drift at a point north of where the raise was to be started, and the water from the drill hole was led into a covered drain under the floor. By means of this arraugement all the steam and heat is kept away from the men at work in the raise. But for this it would he fearfully hot in the raise, and the steam would he almost blinding. As it is, the floor is so hot that it almost burns one's feet to stand upon it. Now that work is progressing in the incline, both above and below, the connection will soon he made. It will he a very important connection for the Hale & Norcross, and, indeed, for all the middle mines.

The Horn Silver mining company, of Utah, has just declared a dividend of 3%, amounting to $300,000, payahle at New York, Feh. 15th; a similar dividend was paid Nov. 15th, and two dividends of $100,000 each prior to that time. The dividend next month will make $800,000. The mine has been put in good shape for steady working and good profits.

The Vizina Consolidated mine produced 675 tons of ore in Decemher, of which 452 tons were milled, yielding $41,618, showing an average of $92 07. The mill was started about ast July, and up to the close of 1881 there had been 5 664 tons ofore milled, yielding $524,900. The mine is now considered to he on a dividend-paying hasis. It has already paid four monthly dividends of $20,000 each.

A dispatch from Tombstone dated 29th, Jan. is as follows: The trial of the case of the Contention vs. the Head Center closed last night. The jury to-day rendered a verdict adjudging to the Contention a large portion of the Head Center, including the hoisting works on that mine. The ground includes all the valuable portion of the Head Center mine, but is not all that the Contention sued for. The verdict is looked upon as a compromise, and seems to he satisfactory to both sides.

The hullion output of the Idaho quartz mine, of Grass Valley, for January (a long month or five weeks) was $75,000. The usual dividend of $7.50 per share will he paid, and enough will he left to carry over a large surplus.

Meetings and Elections.

SIERRA IRON CO.—Jan. 28. Trustees—P. N. Lilienthal, J. Banjamin Chas. Kohler, F. McKnight, President, P. N. Lilienthal; Vice-President, Chas. Kohler; Secretary, H. Fe Bu-h; Treasurer, Anglo-Californian Bank.

SILVER STAR MI. Co.—Jan 28th. Directors—E. W. Asbby (President), S. T. Lathrop (Vice-President), J. F Broadhead, H. J. Spear, A. M. Wing. J. W. McClung (Secretary.) Tha Silver Star is located in Gila county, Arizona.

PACIFIC SOCIAL SCIENCE ASSOCIATION.—Presideut, C. T. Hopkins; Vice-Presidents, Alvan Flanders and M. R. Leverson; Recording Secratary and Treasurer, William Royal; Corresponding Secretary, F. B. Perkins. Trustees—C. T. Hopkins, E. W. McGraw, A. McF. Davis, G. K. Porter and Thomas L Taylor. Committea on Admissions, B. B Redding, D. C. McRuer, S. W. Holdaay, C. A. Wasbburne and Dr. A. B. Stout.

PACIFIC ROLLING MILLS CO.—President, Wm. Alvord; General Manager, L. B. Benchley; Secretary, C. M. Keeney; Superintendent, Patrick Noble.

MANHATTAN S. M. CO.—Feb. 2. Directors—A. K. P. Harmon, B. W. Paxtou, C. G. Gibbs, Melville Curtis, E. B. Pond. Tha Secretary's annual report shows that during the year the company received $2,354,049.52 and disbursed $2,358,892 15; casb on hand, $4,160.25.

New Incorporations.

The following companies has been iucorporated and papers filed in the offica of tha Superior Court, Department No. 10, San Francisco:

Gold Alda M. Co., Jan. 28. Location, Nevada. Capital stock, $1,000,000. Directors—P. A. Barney, W. H. Stanley, Joseph Nash, J. C. Plunkett and A. W. Blair.

Inyoreka M. Co., Jan. 28. Location Inyo Co., Cal. Capital stock, $10,000,000. Directors—H. T. Graves, F. B. Wilde, C. P. Chesley, J. W. Shaeffer and W. D. Jobnaton.

Pacific Electric Co., Jan. 28. Object, manufacturing and dealing in electro-galvanic belts and other electrical appliances. Capital stock, $50,000. Directors—Charles H. Wbeeler, A. T. Sherwood, H. W. Hendricks, E. L. Willard and F. B. Rae.

REVIEWING its various articles on the anti-Mormon hoom, the New York *Tribune* says: There is a fair prospect that some action will he taken by the present Congress by which the Mormon evil may he effectively reached at last.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to tha mines mentioned.

CALIFORNIA.

ALPINE.

STELLA.—*Mountain Argus*, Jan. 28: The work in the Stella mine is progressing very auspiciously. Wa are informad that they bava an immense body of rich ore at tha mine, and the mill is working up to from 85% to 90% of tha assay. The company bave shipped three bars of bullion already, and will ship more next week. Cy. Lebrecque passed through town yesterday, having in his charga upward of 8 tons of cement copper, from the Stella mine, which is to be forwarded to Dayton, Nevada.

AMADOR.

VOLCANO.—Cor. Amador *Ledger*, Jan. 24: Richardson & Canley, who have been prospecting around here for some time, bave found their bonanza in tha shape of a fina quartz ledge, showing frea gold, at a deptb of 12 ft. The owners of the Golden Gate have come to the conclusion that it is useless to wait for water sufficient to run the mill, and bava started the machinery with steam. The De Soto, at Pioneer, bas been abandonad on account of the paying ore having run out.

SUTTER CREEK.—Amador *Dispatch*, Jan. 28: The Saaton mill commenced crushing ore last week. They are using one of Donnelly & Co.'s water-power wheels, under 230 ft. pressure. Forty-two inches of water is all that is required, and everything is running very satisfactorily. The Hazard mine, owned by Alvinza Hayward, will commence operations this week. They intend to run a tunnel into tha hill, for the purpose of striking the lode. This mine is on the main belt or mother lode, and adjoins the Bunker Hill. H. Reese, an old and experienced miner, will have charga of the work. Monday of this week was pay day at the Con. Amador mine. They were paid for two months, and consequently the boys are very flush and are making it lively.

THE JOHN BULL.—Tha rich strike at the John Bull diggings, of which mantion was made last week, still continues to be mora satisfactory as the work of development proceeds. They bava cut into the ledge a distance of 10 ft and have not yet reached the hanging wall, therefora it is not yet known how thick the ledge is.

CALAVERAS.

SURFACE MINING.—*Echo*, Jan. 23: Gen. Beauregard, alias Ruba Stevens & Co., are now engaged in surfaca mining near Angels Camp. Tha General tells us that the mine prospects well, but owing to the scarcity of water he will be compelled to dry-wash for a time. The process of dry-wash may not be generally understood by the public, therefore some explanations may be necessary in order that a thorough understanding may ba arrived at. The General says that he first digs the dirt, leaves it to dry, then pulverizes it thoroughly, passes it through a windmill of his own invention, by which means he says the dirt is blown away, and the gold is collected in ona huge heap. This machine is simple in construction, easy to work, and obviates the necessity of using quicksilver. Ha intends soon to apply for a patent for his mill.

EL DORADO.

CLIPPER.—Georgetown *Gazette*, Jan. 28: The Clipper quartz mine, a few miles above town, bears a good raputation among the most practical miners of this section, notwithstanding tha failure of tha company who undartook to work it over a year since under Supt. Beardsley. It is said that the rock was paying $12 a ton when they shut down. The failura is attributed to bad management. With proper management the Clipper can be mada to pay handsomely. This is the general opinion of those acquainted with tha mine. The parties who workad this mine prior to the above company ware all practical working miners, and they made the rock pay. Thoro are plenty of such men to-day ready to take bold of tha Clipper if they could lease it on reasonable terms.

THE wintry weather of the past few weeks has caused an almost total suspansion in mining operations on this divide, and items of interest are consequently scarca.

THE Bright Hopa mine, a mile northeast of town, was located one year ago, at which time no quartz claim adjoined it. Since, three successiva claims have been located on its south and town on its northern extension, and one touching it on the southeast. The Bright Hope is an example of what continued and energetic prospecting will do. At first tha prospects were small, but they gradually improved as the mine was developed in depth, and to-day this mine promises to become a good property. The lode is from 7 to 9 ft wide, and 500 ft of the lode prospects very evenly. The owners believe that the ora will mill $8 right through, although they are taking out considerable $12 rock. We mention this merely to show what can be done by staying with a mina and developing it.

Careful and untiring prospecting frequently rewards the quartz miner for his time and patience. Therm are several good quartz mines in this district which only await careful development to make them a good paying property. We believe this, and not only do we preach it through the little *Gazette*, but devote more than one-half of our time in the practical use of the pick, shoval, drill and pan.

BIG MINING SALE.—*Mountain Democrat*, Jan. 28: Prof. Thomas Price, of San Francisco, has purchased from John Blair, of this city, tha Rose, tha Chester and the Gregon Hill mines, drifts into which will be started soon from the 600 level of the Placerville Gold Quartz Co.'s claim, and there is good reason for predicting that within thra months there will be at least 150 miners at work in exploring and developing these fine properties.

INYO.

BROWN MONSTER.—Engineer Wm. Hedge returned yesterday from the Brown Monster mill, where he has been engaged in repairing the penstock and water-wheel. Tha mill is to be started up, or at least one battery of it, on 200 or 300 tons of ore from mines belonging to Messrs. Reynolds, Thorpe and others. In the meanwhila Alex Clark is making a thorough clean-up of the mill, at a very considerable profit to all interested.

RICH GOLD ORE.—Si. Reynolds and Tom Treglore brought in yesterday a very fine specimen of gold quartz, taken from their claim called the Ranger, which is situated a little north of the Brown Monster and Hirsch mines, in the Inyos The specimen is as large as a man's fist, and shows free gold in 20 different places; some of it quite coarse. The vein is said to be 2 ft wide and shows rich quartz throughout. There are several fine gold prospects in the locality of the Ranger, which are very conveniently located for working, and we expect to see some good paying mines opened in that section during the coming year.

A MINERAL PICTURE.—Mr. Woodhull, of the assay office, has been getting up a beautiful case of minerals, set in a frame 14x18 inches. The case contains 100 different selected specimens of ores, from as many different mines located in Inyo county. The specimens are about 1 inch square. They are of various bright colors, and are neatly cemented upon an ornamented background. The contrast of the colors, and the flashing of the light from the faces of tha crystals makes altogether a handsoma ornament.

THE EAGLE MINE.—This mine is owned by Geo. Desalier and Phil. Cartiar, who have been hard at work on this claim for tha past month. The Eagle is situated in Mazourka canyon, and is very conveniently located for working. Tha ore is of a smeltiog character and soma of it assaya over 100 ounces of silver per ton. A shaft is being sunk on a fina vein of ora over 2 ft in width, which can be traced several hundred ft on tha surfaca.

BEVERIDGE.—Supt. Fuentes has arrived from Lona Pinn from his San Francisco trip, with the intention of immediately startlug up work on the Keynot mina to supply ora for the mill and arastras.

CERRO GORDO.—Sam Cowles bas returned to Cerro Gor-

do, after an extended trip through most of the Eastern cities. He says there is no place like California, and is glad to get back home. Diaz is working five men in the San Lucas, which is looking well. Crapo is prosecuting developments on his section of the old Buena Vista ledge. Hoff has a fine body of ore in the Osceola.

MARIPOSA.

THE MARBLE SPRING MINE.—Mariposa *Gazette*, Jan. 28: Capt. Utter, who returned to Mariposa on Thursday evening last, came from Yosemite valley by the way of Blacks on Bull creek, the Marble Spring mine and Coulterville. He says the Marble Spring quartz mine, formerly known as the Compromise mine, owned by A. G. Black and sold by him to a company who have a 10-stamp mill, have with in the last day or two in the mine, struck some exceedingly rich ore, which is exciting the admiration of all who can avail themselves of seeing it. It appears that the ree at find was a rich pocket, which was discovered by a Chinaman, who, what he couldn't carry away, covered up, and was doing this kind of business when it was found out by the foreman, who had been absent at the time it was discovered. How much John got away with cannot well be ascertained. At any rate a pan of dirt taken from the spot covered up, washed out upwards of $100.

THE OLD BUNNELL MINE.—This mine, located a short distance from Black's hotel, on Bull creek, now owned by Peter Longhurst, is turning out excellent rock, which will soon be put to a crushing test and the result known, of which there is but one opinion—that it will be a paying enterprise.

THE REED TALC MINE.—This mine, we are pleased to learn through Capt. Utter, who has just visited the locality, where he was kindly waited upon by Mr Shreve, the gentlemanly owner and manager of the works, and was shown sufficient to convince any one that the enterprise is an undoubted success. The patent pulverizer now completed and in order, has a capacity for pulverizing 30 tons of talc per day.

NEVADA.

SARGENT & JACOBS' CLAIM.—*Transcript*, Jan. 27: Work has been resumed this week at Sargent & Jacobs' drift mine after about three months' idleness. The water is all out, and a Sturtevant blower was taken up yesterday so the mine may have plenty of good air hereafter. The shaft is 233 ft deep, the main tunnel 600 ft long, and for some time before operations were suspended last fall the air was so foul that the men could not work to advantage and their candles could not be kept burning while in an upright position. The gravel was improving rapidly in quality and quantity when the last work was done.

PLACER.

HUMBUG FLAT ITEMS.—Placer *Herald*, Jan. 28: The Crater mill started pounding away recently on 60 tons of fine looking rock from the Muring and Schnabel mine. The men who have been re-timbering the Crater shaft have completed the job, and are now out of employment. Wood, and poor wood, at that, brings $5 a cord at the Crater hoisting works. Jo. McLaughlin is taking out some handsome specimens from surface croppings, about a mile north of Ophir. Lew. Kittler and his partner are building an arastra on a new plan, which will soon be completed. There are a good many prospectors in this locality. Some are doing well, and most of them, it is gratifying to state, have encouraging prospects. Wm. Pellow and L. Hutchinson are sinking on a ledge west of the Crater that looks very well.

PLUMAS.

PROSPECTING.—Greenville *Bulletin*, Jan. 25: The fine weather of the past week has been unusually favorable for prospecting, and more of that work has been done than at any former period. From all sides, reports are coming in almost daily of good prospects being found in both quartz and placer claims. Beyond all doubt, the coming season will be the busiest ever seen in this district.

LEADS.—A report comes that Mr. Hinchman has found a large and fine looking ledge near Mr. Stampfli's place. James Monroe has lately found, near his placer claim, a gold-bearing quartz ledge, which prospects well. The vein is 5 ft wide. Another report is current that a certain young man, who lives at Crescent Mills has discovered a very valuable ledge on ground belonging to the Green Mountain M. Co., and refuses to tell where it is unless paid $500.

COPPER.—In a small canyon, opening on Light's canyon, Messrs. Ford have men at work opening a copper ledge. Four days ago parties visited the mine and found a cut across the vein, which is 40 ft wide. The whole mass of rock is full of copper. The ledge was first seen in the bed of the brook, from which it rises in a slanting direction up the mountain, cropping out for a distance of 1,000 ft or more. The fracture of the rock is like brightly polished copper, the metal being in excess of all other matter in the mass. Everyone who looks at the specimens is astonished at their beauty. Mixed with the ledge matter is a large quantity of soft, black material, which is supposed to be silver ore; some of this has been sent to Oakland for analysis. The mine is called by the name of "Bull on." Not so far up the canyon is another copper ledge, called "Enterprise," owned by the same parties. A shaft has been put down on this ledge to a depth of 42 ft, in ore all the way. Some time ago a lot of this ore was hauled away, and $8,000 worth of copper smelted from it; but owing to the depreciation in the value of the metal soon afterward, and the owners of the mine not having capital to invest in the erection of smelting works, all further work on the ledge was stopped. This whole region is filled with valuable minerals of various kinds, and only needs capital for its development.

THE LEAVITT CLAIMS.—Plumas *National*, Jan. 23: On Monday we took a look over the claims of Leavitt & Brown, at Newtown, and found the work going on in good shape and things progressing at a lively rate. Last fall the owners took out good pay, working to an old drain tunnel which was run years ago, but it was found that the ground was to deep for the drain, and a new one was started and rapidly pushed through. The new tunnel is 1,000 ft in length, and is now in bedrock some three ft, the top of the tunnel is in splendid looking gravel which pays well. A couple of week's work will put it through into the ground that it started for, and then the working force will be increased as fast as room can be made for the men. The dirt is raised to the surface with a horse-whim, and everything shows that the owners know what they are about. They have a large section of rich ground above them, and will take out lots of dust in the next 12 months. Several claims adjoining them are known to have the same channel, and it is probable that work will commence on most of them with the coming spring.

SHASTA.

NEW MINES.—Shasta *Courier*, Jan. 28: A visit to the new quartz mines discovered near Middletown, convinces us that the ledges are not only rich in free gold, but are well defined and have every indication of permanency. The principal ledge has been traced a distance of half a mile by the croppings, which are from 1 to 6 ft in width. Free gold is visible in nearly all the croppings, which pay wages to men working with hand mortars. All of the ledges have been located upon and notices posted thereon. If the main ledge is only half as rich as anticipated, the prospects are that Middletown and Centerville will soon be rivals for the county seat.

LOG.—The recent strike of rich ore in the Chicago mine is the most interesting event to us at present. The ledge is 2 ft wide, the whole of which will go well into the hundreds per ton. The find is on the surface south of the old work. The cut and tunnel has exposed the vein for 20 ft, showing quartz in the face generously sprinkled with native silver. The new shaft of the Bullion is down 26 ft on a 4-ft ledge, showing an increasing quantity of mineral-bearing quartz as depth is attained. J. E. Strong is working on a small vein of good gold ore near his place. Crum's arastra is running on quartz from W. G. Cooper's ledge. E. Meeke is working on a vein near the old Atlantic, and taking out some good ore. Geo. Cunningham is also taking out some good quartz near the falls. E. L. Bullou's arastra is running on good ore, with an abundance in sight in the Manzanita, and hope to keep it going for some time to come. The Continental Con. has labored under many difficulties, but with plenty of the kind of ore that is now coming from the mine their success will be assured.

SIERRA.

A RICH STRIKE.—Sierra *Tribune*, Jan. 28: At the Marguerite quartz mine, located at Loganville, this county, a rich streak of ore was opened out last week. It is said that one piece taken from the ledge contained $1,700, while all the milling ore assays $200 to the ton. This is very encouraging for the owners and Sierra county, the company having worked their property but a short time.

THE ALASKA.—The Alaska Co.'s 20-stamp mill at Pike City, which has been under repairs for three weeks past, started up again the latter part of last week. The prospects of this mine continue as favorable as heretofore, and if no change for the worse takes place in the character of the ledge, it may be expected that this property will soon be placed on a dividend-paying basis.

THE CENTENNIAL.—The Centennial Co.'s drift claim at Minnesota still continues to improve daily. From two pans of dirt taken out of the sluices last week, more gold was found than the result of any week's washing heretofore. The owners are all in high spirits, and are very confident they have struck the true pay channel.

RUBY.—*Mountain Messenger*, Jan. 23: The Ruby tunnel is still going south of east, at a hight of 60 or 70 ft above the main tunnel. No work is being done in the main tunnel. The Suffolk M. Co., of Wahoo, has bought the old Pioneer ditch, which was originally intended to bring water from Gold lake. Only a portion was ever finished.

NEVADA.

WASHOE DISTRICT.

GOULD & CURRY AND BEST & BELCHER.—*Enterprise*, Jan. 30: The west crosscut, 2300 level, was advanced 45 ft; total length, 628 ft. The drill-hole from the face of the northwest drift is in 185 ft.

HALE & NORCROSS.—The northwest drift on the 2500 level is in 84 ft, having been advanced 18 ft during the week through the same character of ground. Have been repairing the winze and changing the donkey pumps.

CON. IMPERIAL.—For the past week most of the men have been employed for the Exchequer Co. The east drift 2300 level, is now in 160 ft from the south winze, the face in a mixture of quartz and porphyry.

EXCHEQUER.—During the present month the north drift, 2800 level, has been cleaned out, repaired and timbered, a drain dug and covered for a distance of 200 ft. Are now within 20 ft of the drill-hole where the water is coming from. Have now encountered a small cave, but expect to get the entire drift cleaned out and repaired in a short time.

GYERMAN.—East crosscut has been extended 45 ft through hard porphyry. Have cut and put in 60 ft of covered drain. Sutro tunnel drift has been extended 64 ft; total length from point "A," 802 ft. The drift having reached our north line was stopped to-day. The Sutro Tunnel Co. will connect with us by the 5th proximo, if not before, as there is probably less than 50 ft between the face of our drift and the face of theirs. At Forman shaft the excavation for tank and pump at 2300 level is nearly completed, and we will commence placing the pump the first of the week.

BLIND MOUNTAIN DISTICT.

MIDNIGHT MINE.—Pioche *Record*, Jan. 21: This mine, of Blind Mountain District, has a vein of very rich ore, from 4 to 8 inches wide, in the face of the drift now being run. Some rich specimens were brought in from there the other day.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, Jan. 28: Eight ft have been added to the depth of the main shaft during the week, and 3 sets of timbers have been put in. The total distance made to the 23d instant was 25 ft. The levels above the adit continue their usual production. There are being extracted and sent to the mill about 63 tons of ore daily. The mill was stopped 2 days during the early part of the week to clean flues and repair the furnace, but has been running steadily since. Bullion shipments for week ending Jan. 26th, $16,115.04. Shipments on January account to Jan. 20th, $49,383.91.1

MOUNT DIABLO.—The east drift has advanced 14 ft, showing small streaks of ore which assay $120 per ton. The stopes above this drift look very well, and are giving considerable ore that will mill $75 to $80. Some good ore has also been taken from below the third level, is the west drift near the head of winze No. 1.

PRINCESS.—The re-timbering of the shaft has progressed for a distance of 75 ft, much better headway being now made than at any time previous.

EAST MOUNT DIABLO.—Since the arrival of the new superintendent operations on this property have taken a very energetic turn.

ESMERALDA DISTRICT.

THE CORTEZ MINE.—Esmeralda *Herald*, Jan. 28: Work is progressing as usual in the mine with most gratifying results. In the drift running toward the Utah a body of good ore has been encountered. In all other parts of the mine where work is going on the prospects are flattering.

UTAH MINE BONDED.—We learn from T. H. Wells, superintendent of the Cortez, that Leonard Richardson, of New York, and he have just accepted a bond from Judge W. M. Seawell and Geo. W. Dorn, for a deed to that famous early-day bonanza, the Utah mine, which adjoins the Cortez; the deed to be given on or before May 1, 1882, on payment of $40,000, of which $5,000 is to be paid in 8 days, and to be forfeited if the purchasers fail to pay the balance. This shows great confidence in the Utah on the part of Messrs. Richardson and Wells, which is no doubt well founded, judging by the Cortez. The property has fallen into the hands of enterprising men, and the people of Aurora rejoice.

EUREKA DISTRICT.

BONDED.—Eureka *Sentinel*, Jan. 27: We learn that the Mountain Boy series of mines, owned originally by the old Richmond company, organized in New York in 1860, and reorganized in 1872 under the name of the Eureka Silver M. and S. Co., has been bonded to O. Collier Robbins for $150,000. The property is located in the Buttercup range, west of Prospect mountain, near the Spring Valley road. Col. D. Manheim, who is a part owner, offered $35,000 for the claims at one time, but his proposition was declined. He, however, got a lease of the property from 1874 to 1879, in the name of his foreman, M. Mulligan, and took out about $60,000. There is a regular ledge, and the ore assays from $120 to $800. The product of the mine in the past has been worked at the Eureka Con. and Richmond furnaces. G. Collier Robbins, the bonder, was superintendent of the mine under the regime of the Buttercup Co., one of the first organizations in Eureka district. When the reorganization took place, under the title of the Eureka M. and S. Co., our fellow townsman, William Arrington, became superintendant. The latter company is still in existence. The mine is now being worked under lease with good results, ore being extracted daily and sent to our furnaces.

FLORENCE DISTRICT.

NEW DISTRICT.—Cor. Belmont *Courier*, Jan. 25: Florence mining district is about 8 miles north of Tybo. Almost daily reports reach us from there of strikes in the mines or new-discovered bonanzas being found. A few energetic prospectors have taken up a spoiled and abandoned district, and were from the first convinced that large wealth was hidden there, and if properly nursed and developed, the cast-away district would prove a bonanza, and so fully were they convinced of the fact that they set to work and organized a new district on Feb. 22, 1881; consequently the infant is not yet a year old, but in riches, as far as developed, proves to be a giant. The Sedan Co. worked faithfully in their mines, with what is termed miners' faith, and they now have enough good prospects to reward them for their labors. They have now a shaft down a little over 100 ft; the bottom of the shaft is completely in good pay ore, with the ledge on the surface 4 ft wide cropping out the entire length of the location and far beyond for a distance of 2 miles. Next is the Louisa. This ledge, too, is cropping out for nearly 2½ miles coming to the surface at the point of location to a hight of not less than 125 ft; this ledge is 10 ft wide at the foot of the high croppings. They have started a tunnel to run on and with the ledge; this tunnel will tap the ledge at least 600 ft deep; the tunnel has advanced about 20 ft, the face of it being now in rich ore. That same company will furnish you with rock, sufficient to run 10 or 20 stamps, of good grade ore, say $75 to $150 per ton, for a long time to come. And, as I said in the start, if Florence district was situated away about $5,000 miles or somewhere beyond the North Pole, people would break their necks to get there, but, unfortunately, it is right at home, and in Nye county, in the neighborhood of Hot creek.

LEWIS DISTRICT.

STARR GROVE.—*Herald*, Jan. 25: The main incline on the Starr-Grove mine has now reached a depth of 300 ft. The incline is being sunk under the ledge, as the country rock is much softer than the ledge. The ore house is nearly full of ore, and the Eagle mill will be started up on Starr-Grove as soon as the teams can haul ore enough to keep the mill running.

CHLORIDE.—The ledge was cut Saturday night in the main tunnel of the Chloride mine and is about four ft in width—broken up some, with good mineral throughout the ledge. The force of miners on this mine will be increased as soon as practicable.

EAGLE.—The ledge has improved considerable during the last week and has a much more solid appearance, with considerable mineral deposited through the quartz.

HIGHLAND CHIEF.—The main incline on the Highland Chief is down over 200 ft and being driven down as fast as three shifts can drive it.

MORNING STAR.—The Morning Star mine still holds its own. The levels are being driven ahead and the ledge looks as well as it ever did. Considerable ruby silver is being taken out.

BETTY O'NEAL.—Sinking on the new shaft has not been resumed, the force being employed in the stopes extracting ore. A new find has been made on the east side of the main winze which promises to open up a large body of rich ore.

PIOCHE DISTRICT.

SHUT DOWN.—The Bullionville smelter shut down last Wednesday, after a successful run of nearly 3 months. It shut down for want of concentrations, the amount on hand being exhausted. It will be ready to start inside of 6 weeks, as by that time the 14 tables that are now running will have concentrated enough of tailings to make another 3 month's run.

TEM PAHUTE DISTRICT.

PRESENT AND FUTURE PROSPECTS.—Eureka *Sentinel*, Jan. 28: Tem Pahute is of several years' standing, and comparatively little developed, owing to its great distance inland, but engineers have lately been surveying for a central road west in the vicinity of Silver Peak; thence to California, which, if completed, will make Tem Pahute grow, and render valuable the surrounding country. The line surveyed passes only a few miles south of Tem Pahuto mountain. Evidently a mineral belt stretches along the southwesterly slope of the mountains, the course of which is nearly due north and south, and bounded by a belt of slate on the east and quartzite on the west, ranging in width from 400 to 800 ft. The lode is mineralized lime, and carries high grade ore, of much the appearance of the Eberhardt ore of White Pine, which, after some assorting, pays about $300 per ton. This is shipped to Bullionville, a distance of 90 miles. Tem Pahute is pleasantly located, at quite an altitude, but so far south as to make the climate much more mild than it is at Eureka.

UNION DISTRICT.

STRIKE.—*Bonanza*, Jan. 28: Yesterday Mr. Murphy was clearing ground for an ore dump on the north side of the north shaft of the Centennial mine and exposed 10 ft of very fine ore. How much wider this new discovery will prove it is impossible to tell, suffice it to say that under the new management this mine is developing into one of the finest properties in Union mining district. The ore in the south shaft is improving in quantity and quality. A resident stockholder declared yesterday that he would not take less than $20 a share for his stock.

ARIZONA.

MEYERS DISTRICT.—Cor. Yuma *Free Press*, Jan. 28: The superintendent of the Montezuma Co. is expected to arrive every day, and start everything going in good order. It is understood that his company have $100,000 on deposit to be used in opening its mines in Meyers district. Mr. Dowling will also shortly commence operations on his property, with a large capital back of him. The working shaft on the Gunsight is being rapidly shoved ahead, and everything is moving like clock-work under the good management of Mr. Caldwell, who is a man of large mining experience, and one who understands his business. The machinery for hoisting works has arrived on the ground. All estimate that the big bonanza mine, the Gunsight, has $4,000,000 in sight, and, when opened up, will surpass anything in Tombstone, or indeed, in Arizona. A mine with 30 ft of ore in the bottom of the shaft cannot be a failure. Work on the Mineral Bed mine is progressing finely, about 20 men being at work in it.

TURKEY CREEK.—Arizona *Democrat*, Jan. 22: John Holmes has asserted the paying qualities of his Goodwin claim to such an extent that he has a force of men taking out ore. This property has paid from the grass roots. Mulvenon and Roach's claim on the Goodwin is looking finely. Fitzgerald and McAuliff's claim, the Big Chief, is down over 100 ft, and looks well at the bottom. The ore is argentiferous galena. The tunnel on the Quick Relief is in over 100 ft. The ore is carbonates. The shaft on the Lincoln claim is down about 50 ft with fine ore indications. One of the best indications of the camp is that those parties who went out last month to do assessment work are still at work. In most every case fine ore was struck which whetted their appetite. The Tuscumbia mill is a great help to Turkey Creek. The superintendent, Mr. Ed. Gobin, is very popular with his miners and chlorider, because he gives them the fairest kind of treatment at his mill. The Tuscumbia mill works up their ore to a high per cent., and gives satisfaction. Turkey Creek mining district is making a very fair showing at present.

WORONOGO (SAN DIEGO) M. CO.—The drifts on both levels are showing up fine looking carbonates. During the past week 9 ft has been added to the depth of the shaft.

TOMBSTONE.—*Epitaph*, Jan. 28: The past week has been a rather quiet one in mining matters, the capitalists and experts from abroad as well as home investors devoting their almost exclusive attention to the progress of the important mining suit which terminated last night.

COLORADO.

THE LEBANON TUNNEL.—Georgetown *Courier*, Jan. 28: Riley & Co., the contractors and lessees who drove the Lebanon tunnel to the Elijah Hisc lode, encountered what they think is the north wall of the lode, last week, and consequently stopped work at driving the tunnel ahead, and on Monday of this week started drifting on the lode both east and west of the tunnel.

THE MASCOTTE LODE.—The Mascotte lode, on Saxon mountain, is owned by H. C. Parker, who is driving an adit on it which has now reached a length of 555 ft and shows a vein of solid yellow copper ore from 1 to 5 inches thick that mills from 1½ to 5 ounces of gold and about 45 ounces of silver to the ton, and 18% copper.

THE LIBERTY.—Mr. H. C. Parker purchased last week from Geo. A. Mills, a one-half interest in this lode, and this week a contract and lease has been given to Peter Shively to sink a shaft at a point 150 ft from the mouth of the adit, to a depth of 100 ft, after which a drift will be run.

THE SUMMIT.—The tunnel which has been driven for this lode during the past fall and winter reached bedrock at a point 130 ft from its mouth, and is now being driven across the lode, which it has penetrated about 30 ft without reaching the north wall.

THE INDEPENDENCE.—A nice vein of ore was uncovered in the Littlefield shaft, on the Independence lode, East Argentine, the first of the week, which assays nearly 1,200 ounces silver to the ton. The vein is from 4 to 8 inches thick, composed of galena and black sulphurets, and was struck in a drift that has been started 40 ft from the surface.

IDAHO.

PLACERS.—Wood River *Miner*, Jan. 26: Four Eastern companies are operating placer claims on Snake river, near the ferry of the Kelton Stage Co.'s line. Some portions of the dirt or gravel taken out and shipped East panned out very rich.

MACHINERY.—We are creditably informed that the new machinery for the Mayflower, consisting of a complete outfit for first-class hoisting works is within 24 hours of Hailey as we go to press. The freighters who have the stuff aboard are under contract to push through to Bullion with all possible speed. As soon as the machinery arrives it will be set up and put in running order.

MONTANA.

THE MOULTON MILL.—*Inter-Mountain*, Jan. 28: From superintendent J. K. Clark it is learned that the west half of the battery in the Moulton mill was started into operation yester day, with very satisfactory results, and that the 40 stamps are now on good ore. The west Howell furnace was fired up at the same time, and is already doing excellent work. The mine, Mr. Clark states, is in splendid condition and is now producing daily from the stopes in the 200 and 300 levels 30 tons of ore, which amount can at any time be increased to 40 tons. The percentage of chlorination in the furnace which has been in operation since the mill was started varies from 90 to 96 6 10, which is exceedingly high considering the somewhat refractory nature of the ore. Preparations for the starting up of the mammoth Corulab pumping machinery are being actively made. The water columns are already in the shaft, the pump rods are in place, and all parts of the machinery having arrived, they now require only to be put together and set up. There is no lack of enterprise and energy on the part of the company, whose intention it is to push the thorough development of the property. To this end the company has already expended nearly $500,000.

MOULTON.—*Inter-Mountain*, Jan. 28: There was not a little excitement on the street last night caused by a report that 13 men working on the Cornish pump, in the Moulton hoisting works, refused to work longer without their regular monthly wages, which were due on the 20th inst. These men, it should be distinctly understood, were not in the employ of the Moulton Co., but were engaged by W. H. H. Bowers, the representative of the syndicate, to finish the construction contract. The employees of the company proper were paid off as usual last week, $24,000 being distributed. The mine is in splendid shape, and the 40 stamps of the mill are in constant and satisfactory operation. The financial standing of the Moulton is as solid as a mountain, and everybody who knows W. A. Clark, who now virtually controls the affairs of the company, knows that it is through no fault of his that the trouble has occurred. The matter rests solely between the contractors, represented by W. H. H. Bowers and the pump machinists, and has nothing whatever to do with the Moulton Co. proper. These statements will bear the fullest investigation and should be thoroughly understood before reports of any character are circulated in regard to the matter.

NEW MEXICO.

GOLDEN PROSPECTS.—*News and Press*, Jan. 28: Conductors Judd, Fuller, Bogue, Lyons and several others are interested with James Osfield, car recorder at Raton, in several prospects in the Cerrillos mining district. Among other claims they have about 20 acres of placer ground. About two pounds of gravel from the claim was washed out here this week, which showed the ground to be very rich. Over a thousand colors were obtained by panning, and particles of gold were plainly detected with the naked eye. It is estimated that the two pounds of dirt yielded 25 cents' worth of the yellow stuff, and the dirt is said to be an average of the claim. What is of more importance than rich gravel is the nearness of this claim to water. One of the owners of it is also interested in the Tennessee mine, only 300 ft away, in which there is a good stream of water, and through his influence this water can be piped to the claim for washing gold.

OREGON.

NOT FAVORABLE.—Jacksonville *Times*, Jan. 27: Many of the miners have been able to do some work since the thaw and rain of this week, though a few of the nights have been cold and were accompanied by frost that served to make water scarce again the fore part of the day. Altogether, the mining season has not been a favorable one thus far, though it is not too late yet for a great change for the better. More rain is wanted. Hannum & Roff of Grave creek, made a good run before the thaw, and are busy again since. Some of the miners have plenty of water again and are at work, but others are not so fortunate. B. Corder, of Grave creek, has found some rich quartz croppings and is looking for the main ledge. Hale & Manning, of Leland precinct, have their ditch completed and will commence active operations at once. Gin Lin attempted to force the water through his ditch (which was filled with ice) damaging it considerably. The Sterling Co.'s ditch has been full of ice and Supt. Ennis has not attempted to run the water into it as yet. There seems to be more snow than ever on the hills and mountains, which will prolong the season to some extent. L. Orme, of Foots creek was in town last week. He informs us that his brother, Alex., is now prospecting for copper in Smith river valley. Bybee & Fisher's ditch to the big bar of Rogue river has been completed and work on the bar will be commenced as soon as the weather moderates. Andrew McGee and Sheppard Bros. are engaged in mining a short distance from Major Barron's place, with flattering results. They cleaned up over $17 worth of beautiful gold after a run of about 2 days. G. K. Justus and wife, of Foots creek, were in town this week. George, who is now engaged in mining, says that most of the miners of that camp are busy since the late thaw and that there will be unusual activity there in case of plenty of water, as several miners have fitted up their claims in a better and on a more extensive scale than ever.

UTAH.

MILFORD.—Cor. Salt Lake *Tribune*, Jan. 28: Milford has a 1 stack complete galena furnace in good order. Also a 10-stamp silver mill in good condition, and as soon as it is demonstrated that 20-oz silver ores can be worked to a profit, this or some other mill will be run successfully, for a large quantity of quartz containing from 20 to 35 ozs silver per ton has been developed in Star district, and by a fair estimate there now lies over 10,000 tons of such kinds of ores upon the different dumps.

STAR DISTRICT.—The Mammoth mine in this district is owned and worked by Matthew Cullen and others. A tunnel is being driven in from Maring's canyon which will strike the ore body at a great depth. The Boston, owned by W. S. Searls, has within the past year been surveyed and patent has been granted. Considerable work has been performed upon the same and a good showing is now had of ores. The Burning Moscow now presents an immense body of low-grade ore that will one day be perfected and successfully worked. The Rebel mine has a perpendicular shaft 200 ft down, and a drift run during the past year. It has a good showing and has produced in times gone by $120,000 in ore. The Hickory is one of the first patented mines in Star district, and was once sold for $80,000, and a 10-stamp mill built at Milford, which cost $40,000. But the ores, after awhile, proved to be smelting instead of milling. The mill has shut down. The Cortez and Esmeralda mines, owned by C. C. Woodhouse of Beaver City, have just been patented, and are true fissure veins of the same character as the Tribune, and are situated west and on the same belt. The Chief of the Hill has just been sold, the parties buying being old miners of Star district who see in it something on which to stake their last dollar.

Recent Contributions to the California State Mining Bureau.

[Furnished by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

Tetradnum, Lower Silurian Fossil—Watertown, N. Y.

Limonite—Gold Lake, Sierra county, Cal. M. Lauer.

Molybdenite—Occurs with quartz in gold mines, Santa Fe, New Mexico. Geo. W. Utter.

Gold Nugget—Near Placerville, El Dorado county. Purchase.

Magnetite—Base of Mt. Hoffman, south side of the dividing ridge between Mariposa and Tuolumne counties. J. S. Shilling.

Magnetite in Gangue (Epidote?)—Base of Mt. Hoffman. J. S. Shilling.

Fifty Samples of Japanese Woods—Purchase.

Half an Ounce of Placer Gold—Jenny Lind, Calaveras county, Cal. Purchase.

Stalactites—Calaveras cave, Cave City, Calaveras county, Cal. Geo. Nichols.

Copper Sword—Found on Chenook beach, opposite Astoria. William E. Dement; brought down from Astoria by Charles A. Hughes.

Ammonite—Gus Point, Shasta county, Cal. J. W. Garden.

Stalagmite—Cave City, Calaveras county, Cal. George Nichols.

Gold Quartz Showing Free Gold—Newly discovered mine near Cave City, Calaveras county, Cal. Joseph Metich.

Building Stone—Mr. Wheat's house, Double Springs, Calaveras county, Cal.

Slate—Which crops out over a large extent of country between San Andreas and Cave City, Calaveras county, strike nearly WNW., dip nearly vertical.

Diorite, with Section—Cut by Frank Attwood. Croppings near Cave City, Calaveras county, Cal.

Chalcopyrite—Campo Seco, Calaveras county, Cal. Taken from a large quantity at Milton awaiting shipment.

Trachytic Lava (?)—Which caps isolated hills between Milton and San Andreas, Calaveras county, Cal.

Convoluted Root—Sluiced from a mining claim at Butte City, Amador county, Cal. Matthew Ryan.

Sphere of Rock Crystal, Quartz, with included Crystals of Rutile—Japan. Purchase.

Photograph of a Flowing Artesian Well—At Battle Mountain, Lander county, Nev., one mile from the town. It yields 2,000 gallons of water per hour. The well is 165 ft. deep. Fifty acres of grass, 25 acres of grain and vegetables are irrigated by it; and 150 acres of desert land are so far reclaimed by it as to be fit for pasturage. The well was sunk by J. A. Blossom, of Battle Mountain. Photograph donated by the *Daily Report*.

Quartz with Remarkable Impressions of Crystals, of a Mineral probably Orthoclase.—This rare specimen should be carefully studied. From Volcano, Amador county, Cal. J. W. Collins.

Clay—Bodie, Mono county, Cal. J. P. Manrow.

Limonite—Idaho. Robert Gardiner.

Carbonate of Magnesia, with Silica—Under the microscope, cryptocrystalline. Aroyo Seco, Monterey county, Cal. Occurs in a vein 2 ft. wide. W. T. Armstrong.

Rutile—Graves' Mountain, Lincoln county, Georgia. Exchange.

Turgite and Limonite—Salisbury, Canada. Exchange.

Thompsonite—Grand Naurais, Minnesota. Exchance.

Mesolite—Near Belfast, Ireland. Exchange.

Pelhamite—Pelham, Mass. Exchange.

Apatite in Calcite—Grattau, Canada Exchange.

Apatite—Templeton, Ontario county, Canada. Exchange.

Apatite—Grattan, Canada. Exchange.

Apatite—Krageroe, Norway. Exchange.

Apatite with Red Calcite—Grattan, Canada. Exchange.

Bronzite, Asbestiform—Pelham, Mass. Exchange.

Pyrophyllite—Graves' Mountain, Georgia. Exchange.

Phosphorite—Logrosan, Spain. Exchange.

Chrysocolla—Templeton, Ontario county, Canada. Exchange.

Tremolite in Dolomite—Lee, Mass. Exchange

Menilite—Variety of opal. Coosaw, South Carolina. Exchange.

Anorthite—Pelham, Mass. Exchange.

Keatingite—Franklin, New Jersey. Exchange.

Fossil Wood—Coosaw, South Carolina. Exchange.

Kaolinite—Richmond county, Georgia. Exchange.

Chlorophane—Trumbull, Conn. Exchange.

Zircon—Henderson, North Carolina. Exchange.

Dewcylite—Templeton, Ottawa county, Canada. Exchange.

Staurolite Crystals—Morgantown, Fannin county, Georgia.

Augite—Templeton, Ottawa county, Canada. Exchange.

Titanite-Ledererite—Grattan, Ontario county, Canada. Exchange.

Augite Crystal—Jefferson county, New York. Exchange.

Danburite—Rossie, Lawrence county, N. Y. Exchange.

Margarite—Trumbull, Ottawa county, Canada. Exchange.

Emery and Margarite—Chester, Penn. Exchange.

Cookeite, Cleavelandite and Tourmaline—Chesterfield, Mass. Exchange.

White Scapolite and Actinolite—Jefferson county, New York. Exchange.

Ledererite, with Black Augite—Grattan, Ontario county, Canada. Exchange.

Chromiferous Augite—Wakefield, Ottawa county, Canada. Exchange.

Knebelite—Cumberland, Rhode Island.

Phlogopite—Burgess, Canada. Exchange.

Kyanite—Graves' Mountain, Georgia. Exchange.

Greenish White Granular Apatite—Templeton, Ottawa county, Canada. Exchange.

Pagodite—Washington, Georgia. Exchange.

Idocrase—Templeton, Ottawa county, Canada. Exchange.

Lazulite—Graves' Mountain, Georgia. Exchange.

Wilsonite—Templeton, Ottawa county, Canada. Exchange.

To JOIN sheet rubber, prepare a cement as follows: Digest in a wide-mouthed stoppered bottle a quantity of purified gum rubber (caoutchouc) cut into fine shreds, with just enough bisulphide of carbon to thoroughly soften and convert the gum into a uniform thick paste, assisting the action of the solvent by frequently shaking the bottle. Moisten the edges of the sheets to be joined with a mixture of one part chloride of sulphur and 20 parts bisulphide of carbon, well shaken together; then spread on the cement, bring the parts together, and put under strong pressure for 12 hours in a room heated to about 80° Fahr. The cement should not be used or kept in the vicinity of fire.

Awards to Workmen for Inventions.

The scheme of awards for inventions, instituted in August, 1880, by Messrs. Wm. Denny & Bros., shipbuilders, Dumbarton, and which has been regarded with considerable interest by very many employers of skilled labor, has just been amended and re-issued to the workmen in their establishment. The results of the scheme, as regards the number of workmen making applications or claims for inventions or improvements, have been thoroughly satisfactory. The number of claims found valid, and the important nature of some of the inventions or improvements for which awards have been granted, have been such as to encourage Messrs. Denny to amend their scheme in one or two particulars, whereby it may be rendered more effective. The maximum limit of award as laid down in the original scheme, was £10; but it has been thought that the smallness of the sum may deter some from coming forward with ideas, or with matured inventions of greater technical importance or value than have yet been elicited. Accordingly, Messrs. Denny and the committee of awards acting between employers and employed in this matter have made a revised scheme wherein the fixed maximum limit of award is supplemented or superseded by the inducement of either (1) the granting of a greater award than £10, or, if considered worthy (2) the award of £10, together with material assistance in securing letters patent for the invention. The following are the principal rules or features of Messrs. Denny's first scheme: 1. Any workman in our employ may claim an award from the committee on the following grounds:—(a) That he has either invented or introduced a new machine or hand-tool into the yard. (b) That he has improved any existing machine or hand-tool. (c) That he has applied any existing machine or hand-tool to a new class of work. (d) That he has discovered or introduced any new method of carrying on or arranging work. (e) Or, generally, that he has made any change by which the work of the yard is rendered either superior in quality or more economical in cost. 2. In the case of a workman who is unable to test the merits of his supposed invention or improvement, either through inability on his own part to make the necessary experiments or to pay for the same, the firm, on the recommendation of the committee may agree to bear the whole, or part, of the necessary expense; and if the invention should afterwards prove a practical success, an award will be granted accordingly. 3. On the establishment of a claim under the conditions above specified, the committee are to make an award, which is not to fall below two pounds, nor to exceed ten pounds. Between these limits the award will be fixed by the committee according to the opinion they may form of the value of the improvement or invention for which claim has been made.

The clauses in Messrs. Denny's second scheme, embodying the changes in question, are as follows: 2. In the case of a workman who is unable to test the merits of his supposed invention or improvement, either through inability on his own part to make the necessary experiments or to pay for the same, the firm, on the recommendation of the committee, may agree to bear the whole, or part, of the necessary expense; or the committee will be at liberty to grant the free use of tools and appliances in the yard for this purpose, and if the invention should afterwards prove a practical success, an award will be granted. 3. On the establishment of a claim under the conditions above specified, the committee are to make an award, which is not to fall below £2, nor to exceed £10. Between these limits the award will be fixed by the committee according to the opinion they may form of the value of the improvement or invention for which claim has been made. But in the case of an invention or improvement being considered by the committee worthy of a greater reward than £10, they shall submit a report on the same to the firm, who may sanction either (1) the granting of such greater award than £10; or (2) should the invention be considered worthy of being protected by patent, an award of £10, together with the taking out at the firm's expense of provisional protection at the Patent Office on behalf of the inventor, all with a view to enable him either to dispose of his invention during the period of protection, or to make arrangements for completing the patent at his own or his friends' expense, provided always, that the firm shall have for all time coming the use of any such invention so provisionally protected at their expense, free from the payment of any royalty or patent rights that may be chargeable on the same, should the patent be completed.

Messrs. Denny & Co., Engineers, Dumbarton, have also, but for the first time, made offer of awards for invention to their workmen, and the scheme is in all respects similar to that just issued to Messrs. W. Denny & Brothers' workmen. The results of this renewed effort on the part of Messrs. Denny to quicken the inventive faculties, and increase the technical proficiency of their workmen are sure to be waited on with interest. It is to be hoped such measures may be productive of the good, which, in some quarters, is only hoped for through the increased institution of technical schools; and that the advantages accruing to the business of the firms in which the system has been introduced may speedily be such as to lead to its adoption in other places.—*Iron.*

Tail-Rope under Hoisting-Cages.

Mr. William Dean writes the following suggestive letter to the *Colliery Guardian:* The line of argument adopted by advocates of tail-ropes is, or need only be, one of figures. I will at once presume we have a pit 600 yards deep, with flat drums, and round ropes 3½ inches circumference, and 13 lbs. per fathom (equal to 3,900 lbs.), and raising at one winding two tons of fuel. Without the tail-rope, we have to overcome a dead-weight at commencement of 3,900 lbs. of rope; and 4480 lbs. of fuel, or 8380 lbs total, plus the friction and strain power, must be supplied to meet this. Now suppose we attach a tail-rope to these cages, what is the result? The resistance to be overcome in the former case was 8,380 lbs., plus the friction; but now we have under the cages a tail-rope, equal in size and weight to the winding rops in shaft, or 3,900 lbs. less dead-weight to lift, so that we have to lift, not 8,380 lbs., plus friction, but 8,380 less 3,900 lbs., giving 4,480 lbs., plus the friction, or simply fuel and friction, and this decrease in dead-weight will give a very considerable reduction in piston pressure necessary for ordinary winding. I have often wondered why colliery proprietors do not, when practicable, apply the tail-rope, and can find no other excuse worthy the name than simplicity. Probably it may be owing to its simplicity that the tail-rope does not so rapidly as could be wished gain in the good opinion of the colliery proprietors. Still I fear some people hesitate to use the tail-rope, thinking it is part of the "Koepe" patent, and cannot consequently without danger be applied. This is not so. The tail-rope is applied to some collieries, and I believe with every satisfaction. I am told at one colliery—a shallow one—where it is working they "effect a saving of five pounds per square inch boiler power," and at another colliery they "save one sixth in fuel." Other instances could be quoted if it were necessary. The tail-rope may be an old rope from off the pit in which it is to work, and will last as long as it can safely carry its own weight, it having no other work to do. The adoption of tail-ropes effects the very desirable result of reducing to a minimum the oscillation of the cages, seeing it acts the part of an additional conductor, and in addition enables the engineer to get up to full speed in a very short time, and at a much less expenditure of fuel. The only things necessary to apply the tail-ropes are an old rope and a dip-hole, and, where flat drums are in use, a moderately shallow dip-hole will suffice; but with vertical or conical drums, provision has to be made, by having a deeper dip-hole, for the increase in velocity of the descending cage, until the "meeting" is reached, when the rope which has accumulated will with equal speed be taken up again. The deeper the pit, the greater the advantage in the tail-rope, and with flat ropes a great saving is effected. The application need not cost more than a mere trifle; no difficulty is experienced at point of return in sump with the rope, and a pulley in sump is unnecessary.

Reckoning Quantity of Coal in Place.

A summary way of reckoning the quantity of available coal in a given area of a seam is to take an acre of coal one inch thick to contain 100 tons; this leaves a sufficient margin for faults and loss in working.

Example: A seam of coal 24 inches thick will yield 2,400 tons per acre. But to ascertain the exact quantity of coal under a given area—presuming the seam to be lying of regular thickness and quality throughout—the first thing necessary is to obtain the specific gravity; then, as this represents the weight of a cubic foot in ounces, it is a simple matter of calculation to obtain the gross weight.

The exact weight of coal seams can be got from the table below:

Specific gravity.	Weight in the natural bed, per acre, per inch thick, in tons.	Weight of a cubic foot in the broken state, in lbs. Large coal.	Small coal.
1.10	111.411	42.62	37.12
1.15	116.475	44.56	38.81
1.20	121.540	46.50	40.50
1.25	126.604	48.43	42.18
1.30	131.668	50.37	43.87
1.35	136.732	52.31	45.56
1.40	141.796	54.25	47.25
1.45	146.860	56.18	48.93
1.50	151.925	58.12	50.62

If the figures in the second column be multiplied by the number of inches any coal seam is in thickness, the result will be the contents in tons per acre.

The weight of coal in its broken state, that is, as it comes to the surface in tubs or otherwise, will depend on its mechanical structure; it has here been computed to weigh in proportion to the solid coal as 62 is to 100, and the weight of the small as 54 is to 100.

PROF. BLYTH, in his lectures at Anderson's College, Glasgow, strongly solicits attention to the very beautiful method of lighting by oxyhydrogen gas. He states that he sees no difficulty in obtaining by many sources of power these gases, separately or combined, storing them as cold gas is stored, and distributing them in the same manner. His rough calculations led the professor to believe that by using wind or water power to produce the gases their use would be economical.

THE San Francisco company's copper mine at Spenceville, in this county, says the Nevada *Daily Transcript*, continues to prosper under Mr. Ellis' superintendence. Last month 38 tons of cement was produced. Copper has recently taken a jump in price, and the mine is now being worked cheaper than ever before.

Hydraulic Pumping Machinery.

The success of the hydraulic pump at the Chollar-Norcross-Savage shaft bids fair to make an epoch in mining on the Comstock. It will, in all probability, revolutionize the methods of draining the lower levels.

The fact that the hydraulic pump was made to operate with the assistance of an engine on the surface, was in itself a great victory for those who had the work in hand, but the operating of the pump by the natural pressure of water brought from a receiving tank placed on the side of Mt. Davidson, is an achievement of still greater importance.

This is the key which is to unlock the treasure house of the Comstock. In other words, it is by this means that the draining of deep mines is made not only practicable, but comparatively inexpensive. Given a cheap and reliable method of handling the water of the mines, and the work of prospecting for bonanzas may be carried on at the pleasure of the managers of the property.

There are reasons for believing that a system of hydraulic pumping similar to that in operation at the Chollar-Norcross-Savage shaft will ultimately be adopted at all of the principal shafts on the lode.

The primary and most important consideration in favor of the new system is that of economy. The first cost of the hydraulic machinery may be as great or even greater than that of the steam-rigged apparatus, but the saving in running expenses is necessarily immense. The cost of wood for the engines of the usual machinery is one of the largest in the current expense of the mine. By the adoption of the hydraulic system the greater part of this may be saved.

The men who manage the most prominent north-end mines are also credited with holding the control of the Virginia and Gold Hill Water Co. This being the case, they have in their own hands a power for operating their machinery which is available, cheap and practically inexhaustible.

There is another advantage in the hydraulic system which is not to be disregarded. It is that of convenience. The usual ponderous pump-rod is dispensed with, and in its place are two stationary pipes, that take up but little room, are not liable to mishaps, and that by virtue of their being immovable, will not endanger the lives of the men who are compelled to work in the shaft near them.

It is known that a great deal of the timber land owned by the managers of the north-end mines has been stripped of its wood, and that the supply is becoming meager. This being the case, a substitute for furnishing motive power must be found, and there can be but little doubt that it will be sought in the application of hydraulics. It may be suggested that the present supply of water would not be sufficient for all the pumps, say they were put in at the Union shaft, the Best & Belcher and Gould & Curry shaft, the Chollar-Norcross-Savage shaft (now in), the Yellow Jacket shaft, and possibly the Forman shaft. In that event it would well repay the companies to bring in another ditch. As before remarked, the wood supply is showing signs of weakening, while the supply of water in the mountain lakes is inexhaustible. When once set to running there is no cost of transportation on it, while with the wood for the engines now in use, the freight is a very great item.

The time for this revolution in pumping machinery may not be as near at hand as indicated above, but that there are reasons for believing that it will come about sooner or later, must be apparent to everyone who will give the subject careful consideration.—*Gold Hill News.*

A New Arizona District.

The Tombstone *Epitaph* says: There have been startling reports upon the streets for the last week in relation to a new discovery in this county, that if one-half is true that is reported, bids fair not only to rival, but to eclipse, the great wealth of the mines of Tombstone. From Mr. A. J. Mitchell, who has just returned from this new Golconda, the following facts have been learned.

Upon discovery of the mines, the prospectors held a meeting and laid out a new district bounded as follows: Commencing at a point on the road from Point of Mountains to Tres Alamos due south of the Pilot Knob, and running thence along said road to Point of Mountains, thence north 10 miles, thence west 10 miles, thence south to the Tres Alamos road, and thence easterly along said road to place of beginning. The mines are situated about five miles west from Point of Mountains, 12 miles west from Willcox, and 18 north of Summit Station on the Southern Pacific railroad.

The Mines.

There are at present about 50 locations in the district, many of which show high grade ore on the surface. The principal and central mines are the Grand View and Antelope, both located upon the same ledge. The outcrop is said to be immense, standing in places from 10 to 15 ft. high, being traceable for 3,000 ft. The assays from the croppings run from $50 to $1,400 per ton. The ledge has been cut through in two places, and the ore was found so rich that it was piled upon canvas and old flour sacks to save the horn silver and chlorides, with which it is completely impregnated. Four assays from these places gave $300, $600, $1,200 and $1,400 respectively. The ore occurs between lime upon the south and quartzite upon the north.

The Engineer.

American Railroad Progress.

Herapath's London *Railway Journal* of a late day, in speaking of the wonderful progress which this country has made in railroad building, says: The figures are startling, but when it is considered what railways are in that country, the alarm will cease. "A railroad there is made instead of a common road, and is very little better than—in some cases not so good—as a tramway. The outside estimate of cost for the 16,000 miles of new railroad is only £5,000 per mile. This would require a capital of £80,000,000. A country that could spend hundreds of millions of pounds per annum in war, and afterwards not only pay the full interests on the accumulated mass of debt, but pay off the principal at what everyone admits to be a wonderful rate, which has already broken the back of that truly ponderous debt, which now enjoys the highest credit, ought not to bend beneath the weight of an undertaking for railways, such as that to which we have referred—£80,000,000 to be expended in 15 months.

Millions spent in war are absolutely lost. They buy nothing. It may be said indeed that they buy less than nothing. They purchase destruction. There is not only the enormous expense alluded to, but there is also the loss of hundreds of thousands of able bodied men, and the waste of material. But when 16,000 miles of additional railway are constructed they immediately do useful work and earn a profit.

America without her railways would be a barren land. Canals can never be there more than partially useful. The frosts are so severe that for a large part of the year a canal is a solid instead of a liquid, and even during the hot months that mode of conveyance is open to the objection that it is not only slow but vapory. Just when the means of conveyance is wanted frost sets in, and destroys the utility of the canal, while the railway is open all the year round.

Already the railway has beaten the canal in America, as elsewhere, and yet it is the canal that is to set aside the railway! No, not exactly the canal, but certain rivers in conjunction with various lakes. But these are all water ways, and open to much of the objection found to apply to that mode of communication; and the connections to be formed are canals. In our belief water, in a country both bitterly cold and intensely hot, can never successfully compete against railways as an all-year-round working machine. Poor's last work points out how the canals in America have shrunk in their business before the operation of the railways, and concludes: "We must have railroads. The 100,000 of to-day will in 10 years by 200,000." There is no doubt that railroad making must proceed apace in America if the country is to progress, and as in the course of the last 100 years the population of the United States has enlarged from 4,000,000 to 50,000,000, and yet the country is sparsely populated, having regard to its enormous dimensions, it is evident that the vast length of line may be doubled without the work being overdone.

The more railways that are made in America the better for the existing lines, except perhaps in those cases where there is direct competition. The large railway systems, however, can only sustain partial competition, and that for through traffic, which is the least remunerative portion of the whole traffic, and which under a war of rates may be absolutely unremunerative (as was the case this year). The local traffic of America is assuming large proportions.

New lines feed old lines, and the more complete a railway system becomes the greater is the growth of traffic.

It may be added that the more rapidly railways are made in America the quicker will be its development in material prosperity, and the better it will be for English manufacturers, for the greater the demand the more certain it is that English goods will be bought. It is simply impossible that the American can make all the iron, steel, etc., that they will require, that is to say, should 16,000 miles of line be constructed in the next 15 months.

Shortening the Voyage Across the Atlantic.

There appears to be no cessation in the efforts to shorten the time between America and Europe. The Atlantic is now traversed by the largest and fastest steamers in the world, and yet shipbuilders are not satisfied.

The latest effort in this direction is by a Swedish engineer, Capt. Lundborg. He proposes to build a steamer about equal in size and power to the *City of Rome*. The peculiar feature of construction is to so build his ship that the main body shall divide the water horizontally instead of vertically. The hull, therefore, projects forward below the water line, and this peculiarity of his design enables him to have large engine room, to get great capacity with shallow draught, and to give his vessel favorable lines. The purpose is to reduce her resistance to a minimum. The power used, 22,800 horse-power, would give the ship, according to the ordinary formula used for calculating speed, something over twenty knots. It is supposed, however, that she would be faster, since little power would be lost in wave-making, the water having a clean run astern, being divided horizontally by the projecting lower part of her hull.

Naval architects are not apt to look with favor on any marked departure from the ordinary principles of ship construction, and therefore Capt. Lundborg's proposed vessel is likely to find adverse critics among them. The London *Engineer*, however, speaks with respect of his ideas, and urges that they be put to a practical test in a steamer of moderate size. Even if his ship is not feasible, however, steam vessels constructed after the received plans are likely before long to make the voyage across the Atlantic in the time set by him.

Useful Information.

Paint Removing.

A preparation, of which potash and soda are the principal ingredients, has just been introduced into England, and is said to be a perfect paint remover. Some experiments made with the preparation upon various specimens of painted wood and metal, all old samples, well painted with several coats of good oil color, were very successful. The compound, which is of a cream-like consistence, quite white, is spread over the painted surface, and after being left on a few minutes, is wiped off. Its action upon the body of the paint is thorough and complete; a saponification is set up which continues; the soda is liberated, and fresh soap formed, and this process goes on, the alkali being liberated as it is wanted, till the whole of the paint is removed. Painted surfaces, in about a quarter of an hour, show every trace of paint cleanly removed, and the wood exposed as if it had been planed.

The action of this preparation seems to be twofold. There is first the destructive action of the applied alkali, always caustic, and next, a continued sponge-like action going on—in other words, a constant and perfect causticity is maintained. The result of the preparation on metal is equally convincing. A gas meter, if exposed to the compound for about 20 minutes, has the Japan removed and the bright metal exposed. Other forms of the preparation are of a weaker character, and nearer to soap in their composition. They are intended to remove dirt, and their action is just the reverse of the compound already described. The preparations are liquid, and are soluble in water, and their cleansing power upon cloth of an unmistakably greasy and dirty character is said to be almost magical. For delicate carvings and fabrics of all kinds, these solutions are adapted, and their use by restorers, decorators and others, will be highly esteemed. The modification of the solution for cleaning cloth is well adapted for restoring the linings of railway carriages, and stuff seats of all descriptions. No scraping or erasing is necessary.

There is nothing injurious, it is said, in the preparation which can attack or injure metals or clothes. They all produce a minimum action on brushes, which is a consideration; and, what is very important, color is not taken out by the use of the solutions. The price is less than that of other preparations. The "paint remover" can be easily applied by being spread over the painted surface to be removed. It is sold in 5-lb. tins, at 2s. 6d. each.—*Oil and Drug News.*

White Slates.

A German, named Schmidt, has patented a school slate, which consists essentially of a stiff piece of white cardboard, covered with artificial or paper parchment, prepared by the action of sulphuric acid upon unsized paper.

They are set in the ordinary wooden frame, and furnish a cheap and indestructible slate. The ordinary size sells for 30 pfennigs (7½ cents). He also makes a peculiar kind of ink for use with these slates, called "children's ink" *(Kindertinte)*. It is made of harmless mineral colors and a solution of dextrine, and has an advantage over common ink, that the blots, which children are sure to make, can be easily washed out with cold water. The same slate can also be used to write on with ordinary ink or lead pencil, and both washed off with a moistened sponge. When the slates are intended for use with lead pencils, they are coated with water glass, which permits of writing upon the slate immediately after washing and while still wet. If in the course of time the water glass film gets dirty, it can be removed with a piece of sandpaper, and a new coating applied with a sponge. The tablet itself shows through the parchment and water glass film perfectly mat white, which permits of its being used in any light, and is especially advantageous for drawing, because the shading of drawing is black, and that is more natural than to make white shading with white chalk. Colored pencils or crayons can also be used, and is useful in teaching natural history.

For discoloring gum arabic, the solution, after being filtered through calico, is mixed with freshly precipitated hydrate of alumina in the wet state, and then filtered through a linen cloth, when a colorless gum solution will result. By filtering the gum solution through a layer of freshly precipitated alumina it can be also discolored greatly, and by repeating the filtration several times a quite colorless liquid is obtained.

Making Hollow Rubber Balls.

The process of making hollow rubber balls, used by children as playthings, is quite curious and may be interesting to those not familiar with it. These balls have a solid surface and are made by a different process from the soft rubber balls (which are perforated by an opening) and are much more firm, durable and elastic. The sheets of rubber prepared for balls are cut into strips of double convex shape. The edges of the strips are moistened with a preparation of rubber and naphtha, by which they are joined firmly together, three of the strips being used for one ball.

This part of the work is done by girls, and a skillful girl can earn about $1.50 per day. When the strips are joined together, the ball is very near the shape of a Brazil nut. Before the last opening is closed, a quantity of carbonate of ammonia is put inside, which, when subjected to strong heat, will make the rubber expand and fill out the ball mold. The opening is then closed with the adhesive mixture, and it is placed in an iron mold of the size and shape of the ball desired. The molds are packed into frames in which they are subjected to the heat of a vulcanizer.

They are kept in place in the frame by iron rods along the side, and when the frame is full, iron plates at the end are screwed down tightly upon the molds to keep them in place. These iron plates are about three-fourths of an inch thick, and so strong is the expansive force of the rubber in the molds that they bend this thick iron rod into a curve. If one of the molds should work out of place while vulcanizing is in progress, the molds would fly out with a noise like the report of a dozen pistols, and the work is spoiled. The action of the heat does the rest. When the molds are opened they contain the perfect round balls with no mark of the places where the pieces were placed. The slight ridge made by the mold is ground off by a stone, and the ball is done.

Oil on a Carpet.—You can get a bottle or barrel of oil off any carpet or woolen stuff by applying dry buckwheat plentifully and faithfully. Never put water to such a grease spot, or liquid of any kind.

Good Health.

A Plague of Worms.

The workmen employed in the St. Gothard tunnel have all suffered from a painful disease not due in any way to the nature and conditions of their labors. In a memoir just published, Dr. Bugnion traces the disease to the presence of the parasitic worms in the intestines of the subjects of the malady. This nematoid worm (*Ankylostoma duodenalis*) was first discovered in Milan, in 1838; it has been met with in various parts of Italy; is extremely abundant in Egypt, and it has also been found in Abyssinia, India, the Sunda Isles, Riode Janeiro, Cayenne, and the Antilles. In the intestines of the first tunnel workmen who died of the disease (at Turin hospital), more than 1,500 individual worms were counted. Many workmen have been severely afflicted, but the extent to which health must be compromised is strikingly indicated by the fact, stated by M. Bozzolo, that he found eggs of *Ankylostoma* in the stools of all workmen he examined without exception. The creature has prodigious fecundity. Happily the eggs are not developed in the person who harbors them; the development begins in the excrement or the moist earth, and gains admission to the intestines with unwholesome water.

Large numbers of laborers from the regions which furnished the workmen of St. Gothard have been brought to this country to engage in railway construction and similar rude employments. They bring their careless and uncleanly habits; and there is danger of their defiling springs and water courses where they are camped, and so spreading the worm pest along the lines of new railways.

Pasteur's Discoveries.

The researches of Pasteur among the lower forms of life, especially those associated with certain malignant diseases, have given results which are, perhaps, more pregnant of benefits to come to humanity than any other work of the century.

That scientist, having discovered that an infant's saliva contains septic germs and is poisonous when inoculated into the skin, is now reported to have made a similar discovery in regard to the saliva of *fasting* adults. It is only when fasting that the parasites are found in the saliva. They are swallowed with the food and do no harm in the stomach. If, by cultivating the specific virus of our more malignant diseases, the morbific elements may be deprived of their malignant character and yet remain capable, when inoculated, of making the organism as proof against the true disease, as a real attack of it would, preventive medicine has entered upon a stage of infinite importance to mankind. So far, the tests seem to justify the most hopeful anticipations.

Still, says a contemporary, that eminent microscopist will scarcely receive the thanks of the community for telling us that our mouth is full of venom before dinner. Can he not turn his explorations in some other direction?

Digestability of Bread.

The readiness of assimilation in digesting bread depends on its greater or lesser porosity, which is also dependent on the nature of the bread stuffs employed and the treatment of the dough. The less gluten the flour contains, the more compact will be the baked loaf, and the more gluten it has the more porous it will become. The cereal flour containing the most gluten is wheat flour; rye flour has less. The starchy component of the kernels of cereals are principally all nutritious matter, being no chemical combination with nitrogen. The starchy matter is changed during the process of baking into starch-paste, and is thereby made more easily digestible. The crust is still easier to digest, as it is the starch-paste converted into dextrine and sugar. It is, perhaps, advisable to have a little bran in the dough, or to have the kernels ground coarsely, producing Graham flour, for the branny particles, intermixed with the nutritious matter, mechanically irritates the inside lining of the stomach, inciting the peptine glands to discharge more of their digestive fluid.

As the nerves of the stomach lining of older persons are rather weakened, this mechanical irritation is decidedly to be preferred to the imitation induced by stimulant drinks or aromatic, spicy substances, which only produce a momentary increase of the discharge of the peptine fluid, while the branny particles of Graham bread act continuously and energetically. Bread must always be well salted, as it contains considerable quantities of alkali salts which would withdraw a great portion of salt from the system by making chemical combinations therewith.

Next to porosity of bread, its contents of water influence its digestability. Dry, old bread is easier to digest, as it must be chewed more than fresh bread; hence it will be better masticated, and the stomach will have less work. It is supposed to be known that mastication is part of digestion, saliva being as well an assimilator as the fluid of the peptine glands of the stomach.

There is but little fat in the bread baked of cereal flour. Wheat contains 1.2% rye, 1.6% of fatty substance. Corn contains very much of it, 4.6%, this being the reason why corn bread is so recommendable for hard-working men.

For men of sedentery habits, corn bread would be hard to digest; wheat bread is better adapted to their requirements. The human body needs the daily supply of fatty substence which can be easily assimilated; thus, the mixing of the dough with milk is very good, the digestion of such bread being rapid and easy.—*United States Miller.*

The Salicylic Treatment of Rheumatism. Dr. Maclagan, of England, who introduced the salicylic treatment of rheumatism, has recently published a work defending the treatment and insisting on its advantages over every other method. Of the 30 salicylic compounds, but two besides salicine itself are employed—salicylic acid and salicylate of soda. After ample trial carried through several years of practice, he concludes, that in rheumatism, 30 grains of salicine should be given every hour, until pain abates, and then every two hours during the day for a few days, and afterwards gradually withdrawn. He insists on the large doses as necessary to develop the full benefits of the medicine. Much complaint has been made in various quarters of the failure of the salicylic treatment, and it is quite probable that this has resulted from insufficient doses. We ourselves have generally been content with 15 or 20-grain doses every two hours in the form of salylate of soda, from which good results follow in the large proportion of cases.—*Pacific Med. and Surg. Journal.*

Proposed Prevention of Rabies.—Dr. L. L. Dorr, of this city, in a paper published in the N. Y. *Medical Journal*, dwells on the fact that no case of hydrophobia, in dog or man, has ever been known on the Pacific coast of America, North or South, although dogs are abundant. This extraordinary fact appears to be well established; at least it is impossible to find any record or history of the disease. He attributes the immunity to some peculiarity of climate, probably its electrical condition. He proposes to test the influence of the climate by sending some dogs from the East immediately after their being bitten by a rabid animal, and keeping them properly secured until the result is ascertained. A more practicable plan would be, he suggests, to have a number of the many persons who are annually bitten by rabid dogs in the Eastern States and in Europe come to this coast, where the influence of the climate would be enhanced by the inspiration of hope. Even if the disease should come on under these circumstances, he thinks it might possibly be so modified as to render it susceptible of cure.

Mines in the East.—Hon. Thos. Wren, during his trip East, succeeded in disposing of some mining property, and returned with full authority to develop the Silver State Con. Work will be pushed in this mine with all possible dispatch. He reports that mining has received a black eye in New York, and that it is up hill work to interest any one in Eureka mines.—*Eureka Leader.*

There is copper all over Wyoming, from Cheyenne to the Yellowstone and the National Park.

MINING AND SCIENTIFIC PRESS.

A. T. DEWEY. W. B. EWER

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SAN FRANCISCO:

Saturday Morning, Feb. 4, 1882.

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Assessment Notice—Consolidated Pacific Mining Co.

Passing Events.

Taking of testimony in the Gold Run debrie suit at Sacramento has closed and the arguments will begin on Feb. 28th.

There is nothing startling to note from the mining regions. The decision in the Contention suit at Tombstone, to which we refer elsewhere, has settled an important dispute in that region.

The season thus far has been comparatively dry, though there is still plenty of time for a good fall of rain for the miners. The Grass Valley *Union* of the 1st says: The eight or ten-inch fall of snow last week was gradually disappearing, and as about all the fun that can be got out of a snow-storm in the footbills is the coasting that the boys can indulge in for a brief period, another visitation of the kind was not particularly desired, but on Monday night there was a gathering of the clouds, followed by a stiff breeze, which brought a snow-storm in its wake, and by 9 A. M. yesterday as much as eight or ten inches had covered the ground in this vicinity, and on higher ground to the east and south of town there was from 12 to 18 inches. If not followed by rain, this storm will prove of great advantage, as the gradual melting of the snow will start the water and give the mining ditches a supply that will start the hydraulic mines, which have done but little piping thus far for the season.

The fire which occurred in New York this week wrought damage to two of our worthy exchanges—the *Scientific American* and *Turf, Field and Farm*. The latter lost a fine library.

Drift Mining.

The gravel from some of the Blue Lead channel mines is very much cemented, rendering it not only expensive to mine, but costly to get the gold out, inasmuch as it resists the solvent and slacking action of water, and has to be crushed in a stamp mill before the gold in it can be obtained. Gravel to pay for crushing must necessarily be much richer than that which will pay by washing. The expense of milling is somewhat less with gravel than with quartz, as a coarse mesh screen can be used and a greater quantity crushed to the stamp. The cars from this mine containing gravel it is intended to mill are dumped on a screen, and the coarse cobble gravel separated and thrown aside as waste.

Drift mining through a vertical or inclined shaft is necessitated whenever it is impossible to reach the gravel by a tunnel, or where the latter would be very long and costly. The shaft, as to first cost of reaching gravel for almost all drift mines, would be less than the running of a bedrock tunnel, but for taking out gravel, the latter is of course far superior. In mining through a shaft it is necessary to raise the pay gravel and mine waters to the surface; for this, hoisting and pumping machinery are necessary, and their entire cost of construction and running are additional to what the expense would be if the mine were opened by a tunnel. Practically, it costs about as much to bring the gravel in any mine extensively worked from the point where broken out to the shaft, and to load it into the cage or bucket, as to car it out of the mine through a tunnel of 1,500 to 3,000 ft. in length. A mine worked through a shaft must yield richer gravel, in order to be worked profitably, than if worked through a tunnel. How much richer, depends greatly on how extensively the mine is being worked, the cost per ton of hoisting, decreasing as the aggregate daily amount hoisted increases. Drift mining became

A Branch of Placer Mining

In this State very soon after the discovery of gold, and it is probable that in the aggregate the gold yield of the drift mines is as large as that either from hydraulic mining or from the surface placers. The tunnels run for drifting are found throughout the entire auriferous gravel regions of the State, and are particularly numerous in regions where the lava-covered channels are found. By far the greater number of these are abandoned, many of them after failing to develop paying mines. Hundreds of tunnels from a few hundred to several thousand ft. in length, through errors in judgment as to the location of the channel, have not been run low enough to get out the gravel, or have missed finding it at all. Drift mining is not now carried on as extensively as during the 15 years from 1855 to 1870, the readily accessible ground having been worked out, and much of what was not prospected then requiring too large an outlay of capital, without any absolute certainty of return. At the present time, the counties of Sierra, Nevada, Placer and Plumas contain most of the working drift mines.

The Hidden Treasure

Drifting mine, at Sunny South, in Placer county, is a fair sample of a drift mine worked under favorable circumstances. It is located on a channel running nearly north and south and having a grade to the south, from which it is worked, of about 70 ft. to the mile. The working tunnel run in on the same grade as the channel, ascending 70 ft. to the mile, keeps about 30 ft. below the surface of the bedrock in the channel. Its length is 3,000 ft. The contract price for running it in a soft slate requiring but little blasting, timbers and track being furnished, is $3.50 per ft. The total expense, including timbers and iron T-rail track, is about $4 per ft. From this tunnel upraises are made every 125 ft. to the gravel, which is blocked off in squares of that length of face. The channel is worked for a width of 500 ft., the pay-gravel being from five to six ft. deep, and consisting for the most part of quartz, pebbles and bowlders, the latter sometimes of many tons' weight. The gold is of 922 fineness and ranges in size of pieces from one-half ounce down. About 60 men are employed as miners breaking out the gravel and timbering. The wages paid are $2.50 per day. The timbers and lagging are cut by contract during the summer, eight or nine men being thus employed. Twelve thousand timbers of all kinds and 80,000 lagging are used annually. From 150 to 200 cars of gravel, of about 3,500 lbs. weight each, are taken out of the mine daily. For a long time it required 10 men to run the cars; at present two horses and two men do the same work. One man is employed washing the gravel and several others as blacksmiths, carpenters, etc. During 1880 the value of gold taken out was $115,000; the expenses, $50,000 for labor and superintendence, and $8,000 for all other expenses, material and supplies, leaving a net profit of $57,000. The mine is owned in 35 shares, for the most part held by working miners and the original locators of the claim.

The Mountain Gate

Drifting mine, at Damascus, is located on the northern end of the same fragment of buried channel as the Hidden Treasure, and only a few miles distant from it. The main tunnel is in 6,500 feet, and the channel above it has been worked out that distance for a width of 200 to 250 feet. For the method of opening up the gravel and other details, the description given as to the Hidden Treasure mine will apply. This channel has the same quality of gravel, the same grade, and by connecting surveys is established to be beyond question the same channel as that on which the Hidden Treasure is located. This is, however, not the only channel in the mine; 6,500 ft. in this channel is sharply cut off by lava, or cement as it is usually termed among the miners, but by running an incline in this cement another channel, running from northeast to southwest, was found 80 ft. lower than the original channel. It is of about the same width as the other, but contains an entirely different kind of gravel, being a blue gravel containing granite pebbles and bowlders instead of quartz. The gold, too, is different, being flake-gold of approximate uniformity in size and being a trifle finer quality. This lower channel contains a larger and richer body of gravel than the old one, but it is worked at a considerable disadvantage. The mine from the old workings run from the face of the mountain inward and under ordinary circumstances would be carried through the upraises into the lower tunnel, and thence, running in the opposite direction, pass out of the mine. Instead of going from the workings into the lower tunnel at every convenient point, the waters are collected in a reservoir, cut in the cement at the inner end of the old workings 6,500 ft. in the interior of the mountain; from this tank there is 40 ft. fall to the lower tunnel. A large overshot wheel, 30 ft. in diameter, is run by this water, and furnishes sufficient power to pump the small amount of water found in the lower channel and to draw up the loaded cars of gravel. The labor employed in all capacities numbers 45 men: 36 miners; 2 men at waterwheel; 2 driving cars; 2 blacksmiths; carpenter, gravel washer and superintendent. Six men are employed on contract during the summer, cutting timber and lagging. The monthly yield for several months past has been from $10,000 to $12,000. The total yield of the mine so far has been about $1,500,000, nearly all from the old quartz gravel channel. The mine is owned similarly to the Hidden Treasure—in shares held principally by working miners.

The Hidden Treasure and Mountain Gate drift mines, just described, are representative of all this class of mines, and are fair models as to what a drift mine should be. Each drift mine, though, is liable to have conditions peculiar to itself, requiring modification of the methods of opening and working described in these papers.

Electricity and Minerals.

Many minerals become electrified, and capable of attracting light bodies after being heated or rubbed. These are said to be pyro-electric or friction-electric. Friction with a feather is sufficient to excite electricity in some varieties of blende, while most tourmalines are pyro-electric. Some minerals, such as topaz, will retain their electricity for hours; others lose it in a few minutes.

A very simple and delicate electriscope for testing this property can be made from a bent glass rod, from which a minute fragment of gilt paper or gold leaf is suspended by a single fiber of silk. On approaching a substance whose electricity has been excited by any method, the suspended fragment will move toward it.

Electricity is of two kinds, each being the opposite or complement of the other. That excited by rubbing a glass rod with silk is called vitreous or positive, while the electricity developed by rubbing sealing wax or sulphur with wool is called resinous or negative. Niter, fluor, apatite, aragonite and epidote, acquire negative electricity by friction, while sulphur, wolfram, tantalite, mispickel and cassiterite, develop positive electricity.

Some crystals while exposed to an increasing temperature exhibit positive electricity at some points of their surface and negative at other points; while the temperature is falling, these points are charged with the opposite electricities. The points at which an ascending temperature develops positive electricity are called analogous poles, and those which develop negative electricity, under the same circumstances, antilogous poles.

THE CALIFORNIAN.—The *Californian* for January shows the introduction of new and progressive features, and is evidence that the editor and proprietor, Mr. Phelps, is urging his publication forward with enterprise and confidence. Several articles are well illustrated, and more in this line is promised hereafter. The articles have a Western localization and coloring which is very acceptable both here and abroad. The contents show an abundance of light and graceful literary work, and attention, also, to the material interests of the State, which will make the *Californian* an active power in both the culture and progress of the coast. The publication has our best wishes for its manifest spirit and accomplishment.

THE miners of Central district are shipping their ores to the Winnemucca Reduction Works by mule teams, side by side with the railroad. The Winnemucca *Silver State* says this speaks volumes for mule power.

New Quartz Crusher.

Allen Oliver, Forest Hill, Placer Co., in this State, has patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an improvement in quartz crushers in which a reciprocating rolling weight is fitted to oscillate upon a bed or mortar into which the material to be crushed is fed. This device consists in an improved means for producing the reciprocating rolling motion of the segmental crushers and in keeping them in place, so that they do not slip in the mortars, while they are allowed to rise and fall as the material beneath them increases or diminishes. This is effected by a series of connecting rods which produce a parallel motion, these rods passing through holes on guides which move vertically in the closed mortar or box, so as to keep a tight joint, while allowing the rods to move up and down in their oscillations.

The mortar beds of the apparatus are supported on a strong frame or bed, and there are as many as may be desired, placed side by side and provided with any suitable feeding device. Within these mortars, the segmental crushing weights are fitted, so that their rims or crushing faces will rest upon the bed. These segments may be united so as to stand side by side, each segment standing in its own mortar, and a shaft passes through their upper ends, extending out upon each side so as to receive the ends of the pitman or connecting rods by which the segments are caused to roll or oscillate. An arm or plate extends downward from this shaft, upon each side, to a point below the level of the mortar bed on the bottom of the segments, and rods extend back from pins on these arms.

A system of rods and connections is formed so as to form a parallel motion which prevents the segments from slipping on the mortar, but allows them to rise and fall to accommodate themselves to the amount of material in the battery without in any way disarranging their motion.

A Bureau of Mines and Mining.

The following is a bill introduced by Mr. Belford, of Colorado, in the House of Representatives, and referred to the Committee of Mines and Mining:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that a bureau, to be known as the Bureau of Mines and Mining, be established in the Department of the Interior, and connected with the Geological Survey, heretofore provided for by law. The purpose and object of said bureau shall be to gather statistics and acquire information respecting the mines and mining operations of the United States, and to report such statistics and information annually, through the Secretary of the Interior, to Congress, for use and dissemination. There shall be at the head of said bureau one chief, who shall be skilled in the knowledge of minerals and mining, to be appointed by the President, with the advice and consent of the Senate, at a salary of $3,000 per annum; one assistant mineralogist, at a salary of $2,000; one chief clerk, at a salary of $1,600; two assistant clerks, at a salary of $1,200 each; four mining experts, at a salary of $1,600 each; and one messenger, at a salary of $600.

SEC. 2. That a bureau, to be known as the Bureau of Manufactures, be established, to be connected with the Department of the Interior. The purpose and object of said bureau shall be to collect statistics and information respecting the various manufacturing industries of the United States, and to report the same annually, through the Secretary of the Interior, to Congress, for use and dissemination. There shall be at the head of said Bureau of Manufactures one chief, to be appointed by the President, with the advice and consent of the Senate, at a salary of $3,000; one chief clerk, at a salary of $1,600; two assistant clerks, at a salary of $1,200 each; four experts, at a salary of $1,500 each; and one messenger, at a salary of $600.

SEC. 3. That there shall be established, to be under the Department of the Interior, a bureau, to be known as the Bureau of Labor Statistics. The purpose and object of said bureau shall be to collect and disseminate statistics and other information respecting the condition, skill, efficiency, and pay of labor in the various parts of the United States and in the various trades and avocations. There shall be at the head of said bureau one chief, to be appointed by the President, by and with the advice and consent of the Senate, at a salary of $3,000; one chief clerk, at a salary of $1,600; two assistant clerks, at a salary of $1,200 each; and two experts in gathering statistics, at $1,500 each. It shall be the duty of the chief of said bureau to make an annual report of the statistics and other information relating to the condition, skill, and pay of labor in the United States annually, through the Secretary of the Interior, to Congress.

SEC. 4. That the bureau now known as the Bureau of Statistics shall hereafter be known as the Bureau of Commerce.

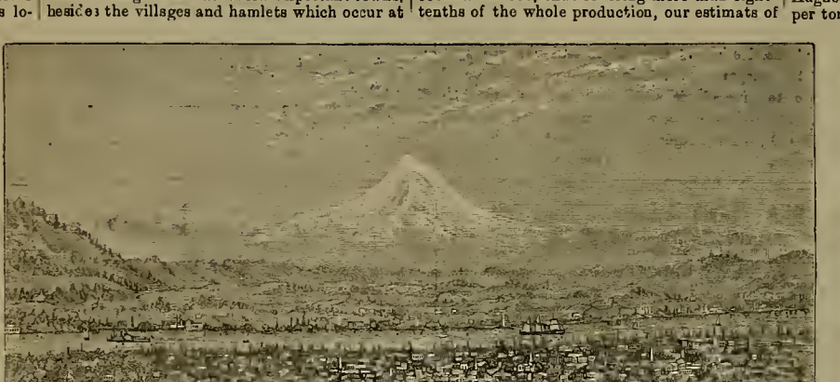
THERE is evidently good ground for the anticipated flow of gold from this country to Europe. The exports of breadstuffs for the year 1881 were $52,000,000 less than for the preceding year. The beef, pork and butter exports also show a large decline. The generally accepted explanation is the drought of 1881, causing a shortage and high prices.

Situation and Surroundings of Portland.

We give on this page a handsome engraving showing Portland, Oregon, and some of the notable features of the country surrounding it. The growth and prospects are themes which the Oregonian never tires to talk about, and they are matters in which all who enjoy the growth and development of the Pacific coast will take an interest. Of late years, Oregon and Washington Territory have secured a large share of the immigration to this coast, and the settlement of the country and the increase of its productions has been notable. It cannot be doubted that progress in this direction has but just set in, and that the coming completion of through lines of transportation eastward will add a new impetus to all industries and swell the population of all well-placed towns, while at the same time it will plant new towns and new country homes upon the vast and rich region which is still unoccupied.

But it is rather of the city of Portland and its immediate surroundings of which we would speak at this time, to enable the reader to understand better the engraving. And in so doing, we shall be free to take paragraphs from local writers, who will present a more appreciative view of the scene than anything we could ourselves prepare.

"Portland—in latitude 45° 30′ north, longitude 122° 27′ 30″ west—is a port of entry, the county seat of Multnomah county, and the commercial metropolis of Oregon. It is pleasantly located on the west bank of the Willamette river, about 13 miles above the junction of the Columbia, and about 110 miles—by the river course—from the Pacific ocean. The city is located on a plateau, which gradually increases in hight as it recedes from the river, until it forms a range of hills at the western extremity of the city, from which may be seen the snow-capped summits of Mounts Hood, St. Helens and Jefferson, the Cascade range of mountains, and the meanderings of the Columbia and Willamette rivers."



PORTLAND, WILLAMETTE RIVER, AND MOUNT HOOD.

Approaching Portland on board a steamer from San Francisco, at the present time, one's first impression of the place is usually of a decidedly unfavorable character, owing to the long line of dingy-looking docks that obstruct the view. However, on landing and passing from street to street, a city of peculiar beauty is opened to the view, and one is surprised at the massiveness of the buildings and general thrift displayed in all branches of business. However, one blot on the otherwise unsoiled picture consists in the narrowness of the streets, most of which are but 60 ft. in width. This defect, however, is soon lost sight of as we move from place to place and see on all sides unmistakable signs of wealth and comfort. From the summit of the hills above referred to, a scene of simple grandeur is unfolded. Away to the north the whole face of the country is dark with timber, through which the silvery water of the Willamette is plainly visible until it empties into the great Columbia, 12 miles distant.

From far up the Columbia, the bright water may be seen as it moves steadily onward to the sea, and it is only lost to sight in the dim distance far to the west. Slightly east of north and beyond the Columbia, the quiet little village of Vancouver is plainly visible, while, overlooking the river to the east of it may be seen the government reserve with its barracks and parade ground, while in the latter a tall mast supports the stars and stripes as they proudly wave in the free air of Heaven. To the right of this, and far off in the north, the pure white summit of St. Helens may be seen reaching above the surrounding mountains, standing 9,570 ft. above the level of the sea; behind it Rainier shows its cap of perpetual snow looming up in the heavens for 14,444 ft. Two other snow-capped mountains are seen to the right, but to grand old Hood, "the pride of Oregon," is ascribed the honor of capping the climax, as it sits in its silent glory, 11,255 ft. high, off in the mountains to the east, perfectly formed, symmetrical and beautiful.

Of Mt. Hood, as it sometimes appears from Portland, a writer in the *Telegram* says: "The day had been cloudy, but the clouds parted just before night so as to send the rays of the sun, as if concentrated for that special purpose, upon the distant Mt. Hood. The effect was to make the snow-capped king of the Cascades appear to lose the 60 miles between us and its great snow-white sides, so that the rough contour was brought out by light and shade with such distinctness, that it appeared as if drawn within a few feet of us; so while we were enjoying a warm, sunshiny evening, with rich, green hills surrounding our city, there stood an enormous pile of the purest and whitest snow at our very doors. It is indeed surprising the variations in the appearance which our beautiful mountain presents to the people of this city, and the whole State, in the different shades of light thrown upon it from different directions as the sun moves over us in his daily rounds. Never twice alike, we are always seeing new beauties in the everlasting hills, and especially the great white-capped mountains seen from this city, Mounts Hood, St. Helens, Rainier and Adams."

The city of Portland embraces a population of about 25,000 of all nationalities. It is the first city in point of wealth, proportionally to size, in the Union. Practically, all phases of life, except extreme poverty, and all occupations to be seen in any American city, are observable here. The tone is higher, as prosperity of sober, industrious labor is greater, and the success of success is more productive of wealth. The proportion of wholesale to retail houses in all lines of trade is much greater than would be expected of its inhabitants. For instance, the number of wholesale groceries actually exceeds the number of first-class retail houses in the same line. The business of several of the former reaches into millions annually. It may truthfully be said that Portland is the market-place for the north Pacific coast, the granary of Oregon and Washington, and the treasure vault of the whole northwest country.

Thirty years ago the city of Portland was little except a dense fir forest, with here and there a clearing yet full of blackened stumps. There were several business houses, where trade was brisk, and a number of temporary buildings for family dwellings, with a noticeable preponderance of hoarding houses and gambling dens. Initial steps had been taken to establish the schools and churches that have since grown into prosperity and permanence. There were no regular sidewalks or public street lamps, and the visitor carried away vivid recollections of the abounding mud. Portland has since grown into a city of over 20,000 inhabitants, is the point where all the great railroads of the present and the future are to meet, and her maritime interests control the entire commerce of the Pacific Northwest. Her schools are second to none in North America.

Our engraving gives a section of the Willamette valley, which is the most famous agricultural region of Oregon. The valley is about 200 miles in length and has several important towns, besides the villages and hamlets which occur at short intervals. Farm houses abound, and orchards; and meadow lands stretch away into little valleys. Level prairies are encountered here, hillowy hillocks there, and dark green forests yonder, diversified occasionally by dense groves of undergrowth. The timber in the valley is principally oak and fir, the latter predominating.

The Willamette valley is famous for its moist climate, its dripping skies being a by-word through the outside world. But it seems that the dwellers there rather enjoy it. In fact, some local writers would have us believe that the inhabitants get so used to rain that they cry for it. We quote as follows:

"The resident will grow to like the humid atmosphere, and, as his years advance, will learn to long for rain when lowering weather ceases. He will learn by gratified experience that the rainy seasons, of which the temporary visitor to the Willamette valley usually complains to the outside world, are not the terror he has been led to imagine. And yet the climate is excessively humid in winter along the coast, and also in the great valleys between the coast and Cascade mountain ranges. There is rain enough to make the unmade roads of a new country very muddy and disagreeable, and to keep them so till the summer sunshine comes to the rescue. But the same humidity that spoils the roads bathes the mountains in perpetual green, and so fructifies the valleys that crops never fail, and all the abundant and varied products of the soil are of the very best quality."

THE military reservations reported to the House as no longer needed by the War Department, are: Fort Fetterman, Wyoming Territory; Fort McPherson, Nebraska; Camp Sheridan, Nebraska; Camp Independence, California; Fort Hartsuff, Nebraska; Fort Benton, Montana Territory; Fort Steilacoom, Washington Territory; Whipple Barracks, Arizona; Coal reservation, on Sulphur creek, Wyoming Territory; Fort Dodge, Kansas; Fort Lyon, Colorado.

LEADING Paris financiers have decided to guarantee the loan of $5,000,000 francs, required by authorized brokers.

The Copper Mining Industry.

The recent advance in the price of copper has attracted attention to that metal to a larger degree than for several years past. In fact, for the first time the copper mines of this coast have appeared as producers on such a scale as to affect the market in the East and elsewhere. To illustrate the relative importance of the various producing districts we take from the *Engineering and Mining Journal* a table, the figures of which, it says, are the result of a careful study of the subject by gentlemen closely allied to the trade:

	Estimated product in 1881.
Michigan	53,000,000
Maine	100,000
Maryland	100,000
Missouri	200,000
North Carolina	2,000,000
Pennsylvania	500,000
Vermont	2,500,000
Wisconsin	
Arizona	8,000,000
Colorado	1,750,000
California	500,000
Idaho Utah Montana	1,750,000
New Mexico	500,000
Sulphur ore from Canada	500,000
Nevada	250,000
Georgia	50,000
Total	71,300,000

According to the statistics officially gathered by Mr. C. E. Wright for the Lake Superior district, the production was 49,738 367 lbs. for the whole year of 1880; and as the output of five of the principal mines, Calumet & Hecla, Quincy, Osceola, Franklin and Pewabic, was a little above 46,000,000 lbs. in 1881, against 42,500,000 lbs. in 1880, thus covering more than eight-tenths of the whole production, our estimate of an increase of 3,250,000 lbs. is a safe one. The Arizona estimate is according to the latest returns.

The item "Sulphur ore from Canada" is a suggestive one. This is the first time such an item has appeared. The ore in question is used for the manufacture of sulphuric acid, and is subsequently treated for copper. The use of pyrites will probably increase here, and, as in England, become the source of considerable quantities of metal.

During the year, the excess of exports over imports was about 7,000,000 lbs., so that the consumption was about 64,000,000 lbs.; the stocks at the close of the year in producers', dealers' and manufacturers' hands being probably lower than at the corresponding time last year.

The highest prices of the year 1881 were at the close of the last month of that year, 20½ cents. The authority above quoted, with regard to our mines on this coast, says: "The course of events for the last two months has been extremely favorable to the development of copper mining enterprises in the West, and, with the growing interest of capital in those ventures, a rapid opening of the country by railroads, a decrease in the cost of transportation, of fuel, and of labor, the Arizona, New Mexico, and other copper mines have a bright future before them, if prudently managed. In the past, our copper producers have been forced to send a surplus abroad, and even in the last year we exported about 6,500,000 to 7,000,000 lbs. If the West becomes a heavy producer, it must seek to conquer and hold the markets beyond the Mississippi by the establishment of brass foundries and rolling-mills in that section. To do this, it will have to compete with the magnificent plant of the Naugatuck valley, against long experience and against a long-established and well-organized industry. The advantages with which it will enter into this contest will be those offered by a saving of freights to the Eastern mills, and return freights on the product to the West, and this will probably be more important to the Northern mines than to those of the southern tier of Rocky mountain States and Territories. The coming year may be one of interesting developments in the copper trade, and the scare which was caused by the opening of the new districts during the last summer is an earnest of the possibilities of the future. While, from present appearances, the outlook is a very promising one, prudence demands that those engaged in copper mining should not forget that we are rapidly approaching a point where production will outstrip consumption. It has often done so in the past, when the Lake mines were the only producers and were ready to sacrifice a portion of the product for export, to hold up prices at home. It is a question whether they will be prepared to continue such a policy until they can succeed in coming to an arrangement with their Western competitors."

England is the great copper market, and London and Liverpool its centers. James Lewis & Sons, of Liverpool, have issued a report on copper for the year 1881, from which we take the following extracts, which will be of interest to our copper mining readers:

During the first eight months of the year 1881 the value of copper varied but little, the extreme rangs over which the prices paid for Chile bars extended being £5 10s. per ton, the highest point touched being £62 10s., early in January, and the lowest £57, on the 16th of May. After the 1st of September, however, a great change came over the market, and during the past four months a very large business has been done in furnace material, Chile bars and English manufactured copper at steadily advancing prices, the increase in the value of Chile bars during this period being £12 per ton, from £59 to £71; and of ore 2s. 4½d. per unit, from 11s. 9d. to 14s 1½d. During May bars fell to £57, but with moderate charters and large sales of furnace material advanced to £59, which was continued to £59 15s. in June, but was quickly followed by a reaction to £58 5s. In July and August the extreme fluctuations were only 10s. per ton, from £58 10s. to £59.

The Board of Trade returns of the imports and exports of copper are quite elaborate, and from them we condense the following figures: The imports of ores for 1881 were 102,640 tons, equal to 12,614 tons fine. Imports of regulus, 8,116 tons, equal to 3,652 tons fine. Imports of precipitate, 36,110 tons, equal to 21,660 tons fine. Bars and ingots equal to 32,170 tons fine. Pyrites, 542,046 tons, equal to 13,551 tons fine.

The exports were as follows: Wrought and unwrought, 34,698 tons fine; yellow metal, 9,440 tons fine; brass, 3,264 tons fine; foreign unwrought, 13,790 tons fine. Total imports, 83,647 tons fine; exports, 61,692 tons fine; difference, 21,955 tons fine.

The apparent English consumption of foreign copper ores, 28,044 tons fine; production of Cornish mines, 2,583 tons fine; British ores sold at Swansea, 435 tons fine; total English consumption of copper, 31,062 tons fine. Stocks of copper of all kinds in England at the end of the year, over 35,306 tons fine. In France they had on hand 3,437 tons fine.

The average price of English precipitate, for 1881, was 12s. 8 3-16 d., and the average in 1881 was 12s. 11d.

Import of Spanish precipitate and copper produce from all countries except Chile, into Liverpool and Swansea was, in 1881, 23,434 tons fine.

Import of Australian, etc., copper into London 9,249 tons fine.

Import of Chile ore, regulus, bars and ingots into England 27,357 tons fine.

Import of Spanish pyritea (as per Board of Trade returns) into England, 13,551 tons fine.

Total import of copper produce into England 73,591 tons fine.

Import of American, etc. copper into France 3,205 tons fine.

Import of Chile copper into France 13,231 tons fine.

Total import of copper produce into France 16,436 tons fine.

Total import of copper produce into England and France 90,027 tons fine.

Export from Chile to all countries 38,000 (estimated) tons fine.

The Board of Trade figures for the year, which differ considerably from those made up by the members of the copper trade itself, show the following results compared with the year 1880:

The import of Spanish pyrites and precipitate is only 600 tons in excess of last year, the decrease in the former being nearly equivalent to the increase in the latter.

The import of ore is about 600 tons fine less, the falling off from Chile and the Cape being nearly compensated for by that from other countries.

The import of ingots, bars and regulus from Chile is about 6,400 tons less, and from Australia and other countries 1,100 tons less.

The total import is 7,400 tons less, and the export 2,200 tons more.

This difference is obtained by a reduction in the stock of 6,100 tons, whereas, last year there was an increase of 2 300 tons.

The home consumption must consequently have been about 1,200 tons less than during 1880, but 900 tons greater than during 1879.

THE verdict in the Guiteau trial elicits from the London *Times* the most offensive article it has published since the Rebellion. It declares that the American people are satisfied with the conduct of the trial, which was a broad farce enacted in court, without one symptom of popular disapprobation.

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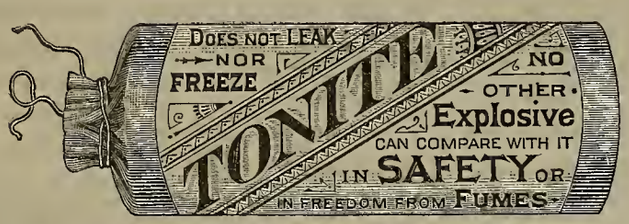

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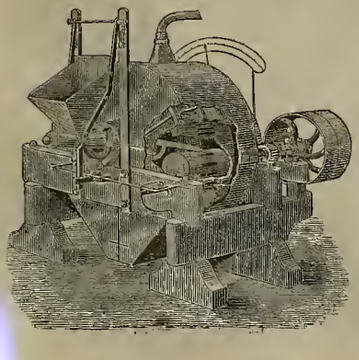

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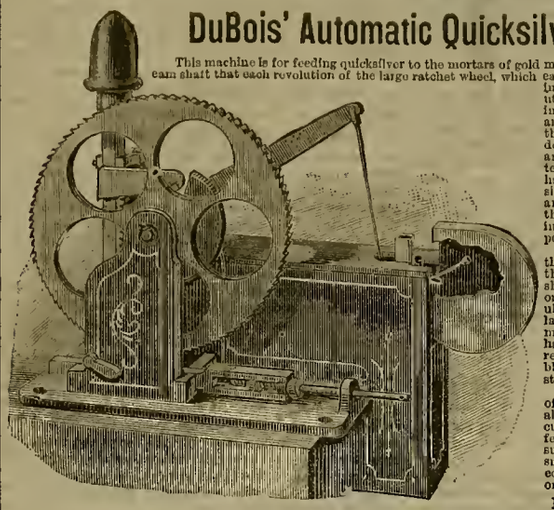

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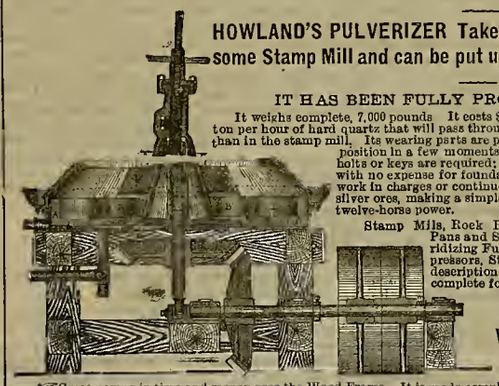

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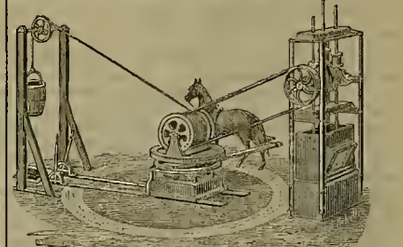
New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
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M. C. IHLSENG, E. M., Ph. D
Civil and Mining Engineer.
Formerly of Columbia College School of Mines, now of Colo. State School of Mines, will examine, survey and report on poperty or methods. Box 409 Golden, Col.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING JANUARY 24, 1882.

252 723.—COFFEE FLAVORING—Frank Broz, S. F.
252,660.—PIN JEWEL HOLDER—F. Gundorph, Portland, Oregon.
252,776.—GRAIN HEADER—J. W. & A. B. Jory, Salem, Oregon.
252 616.—PEA SHELLER—F. Molini, S. F.
252,792.—QUARTZ CRUSHER—A. Oliver, Forest Hill, Cal.
252,793.—AMALGAMATOR—A. Oliver, Forest Hill, Cal.
252,803.—GRAIN SEPARATOR—D. Salisbury, Williams, California.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'e SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

AMALGAMATOR AND CONCENTRATOR.—Allen Oliver, Forest Hill, Placer county. No. 252,793. Dated Jan. 24, 1882. This invention relates to an apparatus for amalgamating and concentrating the valuable metals, and also for concentrating sulphurets; and the inventor calls it the "automatic hydraulic amalgamator and concentrator." It consists of two sluices placed side by side, and provided with gates which are operated automatically by suspended water boxes. A main sluice brings the pulp from the battery to these two sluices, and while one is receiving the pulp, the gate of the other is closed. The sluices have a double bottom, the upper one being perforated and provided with upwardly projecting brushes. A frame of water pipes, with transverse, wedge-shaped, hollow riffles, which are perforated for egress of water into the pulp, is moved up and down continuously to agitate the pulp and assist in concentrating. Suitable discharge gates are opened and closed automatically, and a flexible riffle at the outlet is operated in the same manner.

GRAIN SEPARATOR AND CLEANER.—Dexter Salisbury, Williams, Colusa county. No. 252,803. Dated Jan. 24, 1882. This invention relates to that class of agricultural implements known as grain cleaners, and it consists in certain details of construction difficult to describe clearly without engraving. The vibrating screens and elevators are arranged differently from what they usually are. In some there is but one elevator and ordinary screens, and in others the elevator takes the wheat directly from the cutting-in hopper, and delivers it upon the zigzag screens, thus accomplishing the result of separating the barley and large impurities at once, while the grain is full of the smaller chaff. In this invention under consideration, the inventor deems it best to clean out the small chaff first, so that when the grain is delivered to the screens, they will have nothing to do but separate the barley from the wheat, and cannot become clogged.

BOX COVER PRESS.—Edwin Austin, Winters, Yolo county, Cal. This invention relates to a new and useful device for holding down the lids of boxes in order that they may be nailed, and which, therefore, the inventor terms a "box cover press." It consists in vertically moving clamps or straps mounted on a suitable frame or table, said clamps being adapted to fit over the ends of the lid or cover, and, through the operation of a lever, be drawn down tightly therein to hold it fast down against the box while being nailed. Means are provided to elevate a low box to the hight of a higher box by hed pieces of different level, so as to keep within the limits of the vertical play of the clamps.

COMPOUND FOR FLAVORING COFFEE.—Frank Bros., San Francisco, No. 252,723. Dated Jan. 24, 1882. This is a compound which the inventor calls coffee flavoring, and which is employed to improve the taste and flavor of coffee. It consists of a peculiar preparation which is mixed and put up in packages ready for use when desired.

QUARTZ CRUSHER.—Allen Oliver, Forest Hill, Placer Co. No. 252,792. Dated Jan. 24, 1882. This device is described in full in another column of this number of the PRESS.

SENATOR GROVER has introduced bills appropriating $500,000 for the improvement of the mouth of the Columbia river, $750,000 for the construction of a canal and locks at the Cascades of the Columbia, and $200,000 for continuing the improvements at the entrance to Yaquina bay, Oregon. These bills, at the request of Senator Grover, were temporarily laid on the table, in order to afford him opportunity to call them up and submit some remarks on them, before their reference to the committee, at an early day.

Alaska Mines.

Fish River Mining District.

EDITORS PRESS:—This district was discovered in June of last year. It is situated in the "Omilak" range of mountains, 30 miles north of Golowin bay, on the north side of Norton sound, and about 90 miles northwest from St. Michaels, a trading station of the Alaska Commercial Co., and also of the Western Fur Co.

Two locations were made by the discoverers of the district in the interest of the Alaska Mining Co., now incorporated as the "Alaska Gold and Silver Mining, Milling and Trading Co." These locations, or claims, are 1,500 ft. in length each, by 600 ft. in width, and join on the summit of the ridge—one being the "Pioneer," on which a shaft was put down 22½ ft. in ore, and a cut made some 600 ft. below the shaft, finding the same character of ore as thus taken from the shaft. The other claim, the "Omiluk," is situated on the opposite side of the mountain. On this claim a shaft was put down 12 ft. in ore also, and of same general character as that in the first shaft. The ore is argentiferous galena, with some iron croppings. Limestone forms one wall, and micacious slate the other, and these walls seem to be separated about 200 ft., where the ore body crosses the mountains, leaving no doubt that there is an immense body of ore at this point. Some 15 tons of ore are now on the dump of the shafts.

The ore carries a very high percentage in lead, as is evidenced by the following assays:

	Silver.	Lead.
By Prof. Thos. Price, trace of gold	$121.28	83%
" " " " " " "	161.86	85%
" Selby Smelting Works	143.51	80%
" E. M. Cram, trace of gold	135.75	not given
" " " " " "	122.83	not given
" " " " " "	155.78	not given

Giving an average of $140.16 in silver per ton; add value of lead, say $70, and we have over $210 per ton of 2,000 lbs.

From the foregoing statement (and these assays were not made from selected specimens, for the entire body of ore taken out would give the same results), the percentage of lead is so great that no reduction works will be required at the mine. Should this ever become necessary, however, there is an abundance of timber near the mine for all practical purposes.

The company propose to send up to the mine in the spring a working force, to remain a year or more, and explore the mine to greater depth.

The mine is about 12 or 15 miles from a point on Fish river, whence scows or barges will take the ore to the vessel landing. The river transportation is about 50 miles. A light-draft stern-wheel steamer will be used to tow the barges up and down the river.

The ore will be moved to the river in the winter with horses and sleds, or by same process may be delivered at the vessel landing by drawing it 30 miles overland.

To mine and deliver this ore in San Francisco, it is estimated to cost not to exceed $50 or $55 per ton. Cost of delivering 1,000 tons in San Francisco, as above, will be $55,000. Value of 1,000 tons at $210, would be $210,000, leaving a profit of $155,000. This, it is believed, will be about the result realized the first year. After which the ore will be handled and delivered for much less than the above estimate.

Ultimately, a railroad will be constructed from the mine to the harbor, a distance of 30 miles, when the ore can be moved at any and all seasons of the year.

I notice in the PRESS of January 28th that a good account is given of the Baker mining district in Montana, by your correspondent "Yehrek," and in speaking of the Baker mine, the "oldest location" and most extensively developed of any in the district, he uses the following language:

"Ore from the mine, shipped to Omaha, netted over $100 per ton; this is certainly a good showing for a 20 ton lot not closely selected. In this connection it must be borne in mind that, before starting it on its long voyage down the mighty Missouri, it was hauled in wagons 250 miles." The ore in the Baker district is both milling and smelting. The ore, then, from Alaska is more accessible, and makes a better showing than that from Montana.

The climate of northern Alaska is not unlike that of Maine and Michigan, and not as cold as Montana and Minnesota. For six or seven months the Esquimaux live in cloth tents, and in the winter many of them live in pole or log huts. The mildness of the climate in this high latitude is attributed to the warm ocean current that flows north, along the eastern coast of Asia, through Behring's sea and straits to the Arctic ocean.

In all that part of Alaska bordering on Behring's sea and Norton sound to the Arctic ocean there were not 50 white persons up to 1882; but now that valuable and extensive mines have been discovered this isolated region will soon fill up with enterprising miners.

The natives are disposed to be friendly and willing to work, and the Government cannot be too vigilant in suppressing the sale of spirituous liquors to them, for it is the most deadly enemy they have ever encountered.

Under the present climatic condition northern Alaska will never be agricultural; its great wealth consists in its mines, furs and fish. Belts of timber run through northern Alaska, but there is no large or valuable timber north and east of the Aleutian islands, until you get up the Yukon into the interior. A. F. W.

Thoughts on Technical Education.

[Written for the PRESS.]

In making practical use of Prof. Davidson's suggestion (published recently in the PRESS) of establishing schools of art, trade and commerce, we meet at the outset two fundamental questions, which must be answered before we can proceed. These questions are: 1st. By whom shall these schools be founded and maintained; and, 2d, for whom shall they be maintained. I shall endeavor to answer both questions in this paper.

The first question:—In his exceedingly interesting summary of the progress of technological education in Europe, we notice two widely divergent sources of efforts. The effort of the State, which is illustrated by France, Germany and Russia; and the effort of the individual, illustrated by the Mechanics' institutions of Great Britain. And this is what we might expect from the nature of their governments. The first are essentially parental governments, the second is non-parental, leaving to the individual what he can do better than the State. In America, education has been considered one of the proper and important functions of the government; so important, that the very continuance of our liberties depends upon its maintenance. But there is a growing belief that is becoming too complex—that the fungus of politics is interfering in the selection of teachers and text-books and proper distribution of school moneys; and some go even so far as to say that in the great struggle for existence, higher public education is a hindrance and not a help. But the strictures on our educational system are common property. They are as equally recognized by the common mechanic who has no practical education whatever as by the head of the coast survey, who is compelled to unlearn the university graduate in order to make practical use of him.

If, then, we wish to improve our public-school system, we must not add new duties, but actually diminish the present ones, and when the remaining ones are perfected, then it is time enough to add others. Until then, special or technical education should be under the control of the individual, and natural pride should prompt our mechanics to form the first trade school.

The second question: Out of 100 children attending the public schools, 72 attend the primary, 24 the grammar, 3 the high school, and only about one out of 200 attends the University; and as the decrease, due to death, amounts to 5%, 3% and 2%, between the ages 5 and 10, 10 and 14, 14 and 17 years respectively, the difference of the above figures fairly represents the number who are compelled to leave school long before they have received even the rudiments of an education, but 20% of the children between the years 6 and 17 do not attend school at all, and so receive no education whatever.

The State has established a University and the city a high school, and it is idle to conceal the fact that these schools, though open to the poor, of course are practically for rich men's children. If, then, a technological school similar to the Stevens Institute were established here, there would simply result a transfer of students from the first-mentioned to the last-mentioned institution, while the great mass of our boys, the future mechanics of San Francisco, would not be benefited. Hence there is the paramount need of the establishment of a school that will benefit those boys who, at the age of 14 to 16 years, are compelled to begin to earn their daily bread. Such an one must of necessity be conducted in the evening and must recognize the fact that its pupils work all day, that they have but a limited time to study, that hard work is incompatible with hard study, and especially that they are *poor*. Such a school, whose studies embraced mathematics, mechanics, physics and chemistry and drawing, and the time five years of 40 weeks each and three nights per week, would do an incalculable amount of good with a comparatively small outlay of money. And as "there is no practice like the practice of the shop," the practical side of their education would be far better provided for than by any instruction in a school.

My answers then are: That individual enterprise, backed by an association of the members of a particular trade, should establish their own trade school, and the aim should be to provide instruction for the mass of its future members. The State could even offer material aid without affecting the management; for, as Franklin says: "Good apprentices make good citizens," and so it would also be benefited.

For the success of this scheme an apprentice law is absolutely necessary, and efforts should be made at the next Legislature to have one passed.

Those that will be directly benefited, the owners of foundries and machine shops, should take this matter in hand. The impetus given to trade last year will continue and augment; and the prophet predicts, that as California has supplied the world with gold and grain in the past, she will in the future supply the nations of the Pacific with the products of her skill and industry. And to do this, she will need skilled, educated mechanics and artisans.

But a little more discussion will do no harm; only let it be *dynamic* not *static*. But above all let us have RES NON VERBA.

Controlling Debris.

The following we take from the Gridley (Butte county) *Herald:*

Of late years the effects of hydraulic mining have been so marked along Feather river that the ultimate destruction of Oroville has become a mere question of time, and gentlemen well versed in the lay of the land and capacity of the mines above the city, are unanimously of the opinion that in less than five years the present site of the county seat will be a deserted waste of debris and tailings. This belief is entertained by many of the leading property-holders, as well as by a majority of the county officials. From Supervisor Gray we learn that a movement has been inaugurated having in view the preservation of the property and business interests threatened, and, also, the perpetuity of the prosperous community. Briefly outlined the plan is as follows:

To purchase sufficient land on the high plateau situated on the west bank of the river (between the western terminus of the bridge and the Infirmary) upon which to re-establish the town, and to remove such buildings as can be moved to the new site. Such buildings as cannot be transferred will be bought and paid for either in cash or by the erection of similar structures in the new town, as the owners may prefer. To accomplish this end, it is estimated that a capital of $5,000,000 will be required. A company of capitalists is now being organized to carry out the scheme. They expect to realize handsomely on their investment by throwing up a huge dam, fifty ft. high and one hundred ft. wide on top, and about one mile in length, across Feather river at a point four and a half miles below the present town site (just below Kent's pond), and then use the mammoth basin thus created (which will be at least five miles long and from one to two and a half miles wide) as a dump for the debris and tailings of all the hydraulic mines located up the river. These mines will be charged a reasonable rental for the privilege of running their debris into this reservoir. The dam will have three water gates located in it, arranged in such a manner that the water will flow through sieve work and enter the channel below the dam free of debris. Among the mines that are expected to use the reservoir are the Miocene, Hewitt, Powers, Minerva, Banner, Greek and Big Bend, and a number of other smaller properties. We are informed that the managers of some of these properties have already signified their willingness to contract for the privilege for a term of years, two companies offering $750,000 each per annum for the same. A rough estimate, based upon interviews held with the representatives of the larger companies, puts the income from this source at $75,000 per annum; and as the mines cannot be worked unless they have a dumping place—and it will take at least 30 years to fill up the basin—it is very apparent that the projectors will reap a large return upon their investment. That there is something more than sensational bosh in this matter, is evidenced by the fact that Supervisor Gray purchased quite a tract of railroad land adjoining the proposed town-site, while in San Francisco last week, on which to put the county buildings. It is a stupendous undertaking, but the interests at stake will justify it, and the amount of capital estimated upon would be ample to insure its successful termination.

News in Brief.

PNEUMONIA is very prevalent in Tombetone, Arizona.

LIEUT. MELVILLE will form five separate parties to search for Com. DeLong.

PIETRO MALDINI, a Swiss, was killed on Saturday at Santa Cruz by a large limb of a tree falling on him.

A MINING man named Adams, from San Francisco, died of hemorrhage of the lungs last Friday at Tombstone.

THERE is every indication of an enormous travel to Europe next summer, and nearly all the steamship lines are increasing their fleets.

IMMENSE amounts of property have been destroyed and much suffering caused by the great floods in the Cumberland and Tennessee rivers.

DAN'L B. FOSTER, a well-known river man, formerly purser on the Sacramento river boats, died at Portland, Or., recently, of acute rheumatism, aged 58.

CHICAGO is happy over the removal to that city of more than one large manufacturer of Cincinnati, who complains that he is overtaxed in "the Paris of America."

THE Joint Committee on the Death and Memorial Services of the late President Garfield, decided upon a programme substantially the same as that adopted for President Lincoln.

THE bill prepared by the Judiciary Committee of the Senate, for the suppression of polygamy, provides that no polygamist shall sit on juries, exercise the right of suffrage, or hold office.

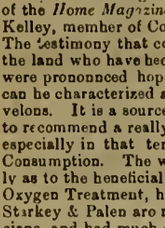
THE jury in the Sproul murder case, at Oroville, returned a verdict of not guilty, after an absence of 30 minutes, on Saturday. The verdict was enthusiastically received by the crowded courtroom.

A BILL has been introduced to extend the operations of the Lighthouse Board over the Willamette and Columbia rivers, from Portland to the sea, and appropriates $3,000 for the erection and maintenance of lights along these rivers.

Compound Oxygen Treatment.

We take pleasnre in commending to the carefulattention of our readers the "Compound Oxygen Treatment." This treatment is becoming very popular as a curative agent, for all diseases of the lungs, and other respiratory organs, consisting principally in oxygen inhalation. Dyspepsia, diseases of the liver, and nervous derangements are also cured by this wonderful agent. A New England physician discovered this great remedy for disease after an almost fatal attack of pneumonia, the results of which did not leave him for months. The dispensers of this Treatment have some of the very best testimonials as to its efficacy from those who have used it. Among those who testified to its curative properties are such men as T. S. Arthur, the distinguished author and proprietor of the *Home Magazine*, and Hon. William D. Kelley, member of Congress from Philadelphia. The testimony that comes from persons all over the land who have been cured of diseases that were pronounced hopeless, in many instances, can be characterized as nothing less than marvelous. It is a source of gratification to be able to recommend a really valuable remedial agent, especially in that terrible disease, pulmonary Consumption. The writer can speak personally as to the beneficial effects of the Compound Oxygen Treatment, hence this notice of it. Drs. Starkey & Palen are regularly educated physicians, and had much experience and successful practice before adopting this Treatment as a specialty.—*Shore Line, Conn., Times, New Haven, Sept. 24th, 1880.*

THERE are two colonies of Mormons in Arizona that are free from Territorial and county taxes. They are so isolated that the cost of collecting amounts to more than the taxes.



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A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

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THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry O. Hanks, State Mineralogist.

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San Francisco Metal Market.

(WHOLESALE.
THURSDAY, January 26, 1881.

IRON.—	
American, Pig, soft, ton	— — @30 00
Scotch, Pig, ton	25 50 @27 50
American White Pig, ton	— — @— —
Oregon Pig, ton	— — @29 00
Clipper Gap, No. 1	— — @28 00
Clipper Gap, White	— — @32 00
Clipper Gap Car Wheel	— @35 00
Refined Bar	4 @
Horse Shoes, keg	— @ 5 50
Nail Rod	— @ 7¼
Norway, according to thickness	6½@ 7¢
STEEL.—	
English Cast, lb	13 @ 15
Black Diamond, ordinary sizes	— @ 15
Drill	15 @ 16
Flat Bar	16 @ 18
COPPER.—	
Ingot	— @ 22
Sheet	— @ 20
Sheating, Tinned 14x18	— @ 31
Nails	— @ —
Bolts	— @ 33
Old	— @ —
Bar	— @ 22
Cement, 100 fine	— @ 15½
LEAD.—	
Pig	— @ 5
Bar	— @ 6
Pipe	— @ 8
Sheet	— @ 8
Shot, discount 10% on 500 Bags	
Drop, per bag	— @ 2 10
Buck, "	— @ 2 30
Chilled "	— @ 2 50
TIN PLATES.—	
10x14 I C Charcoal	— @ 7 50
10x14 I C Coke	6 15 @ 6 40
Banca Tin	— @22 50
Australian	— @23 50
I. C. Charcoal Roofing 14x20	— @ 6 90
ZINC.—	
By the Cask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb. less the cask	— @ 10
NAILS.—	
Assorted Sizes	4 00 @ 4 15
QUICKSILVER.—	
By the flask	@37½ 41
Flasks, new	— @ 1 25
Flasks, old	— @ 1 05

AMERICAN MINING CODE,

BY
HENRY N. COPP.

To replace Copp's Handbook of Mining Laws, now out of print United States, State and Territorial Mining Laws and Land Office Regulations; Digest of Land Office and Court Decisions; List of Patents Issued, and Dr. Raymond's Glossary, with Forms for Mechanics' Liens, Location Notices, etc.

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A physician who has long resided in the mines and other parts of California, and gathered a large and valuable collection of minerals and other specimens, offers the same for sale at a bargain. Address "Cabinet," box 2361, San Francisco.

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Consolidated Pacific Mining Company.

ASSESSMENT, NO. 4

Amount.....Forty Cents per share
Levied.....January 28, 1882
Delinquent.....March 3, 18-2
Day of Sale.....March 27, 1882

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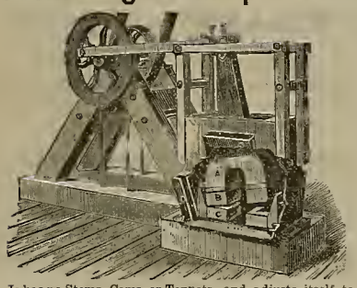

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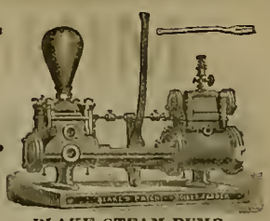

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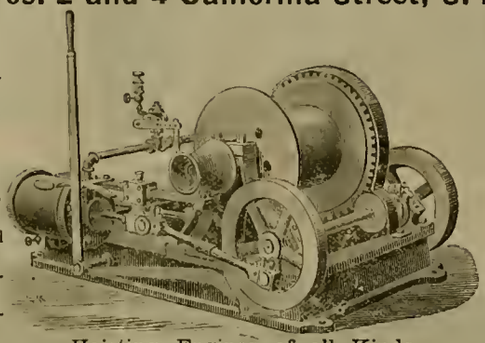

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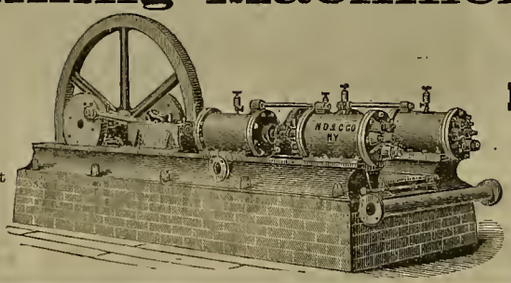

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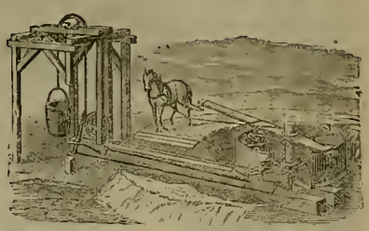

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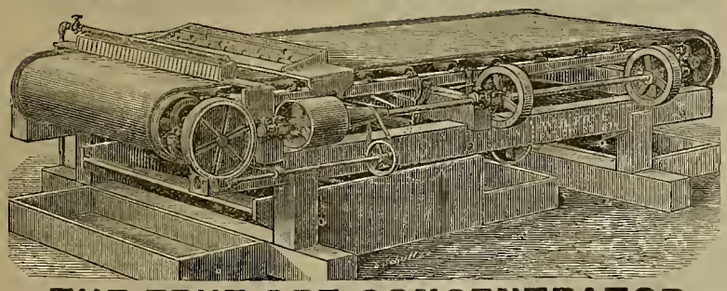

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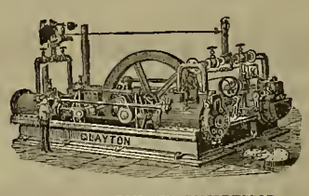

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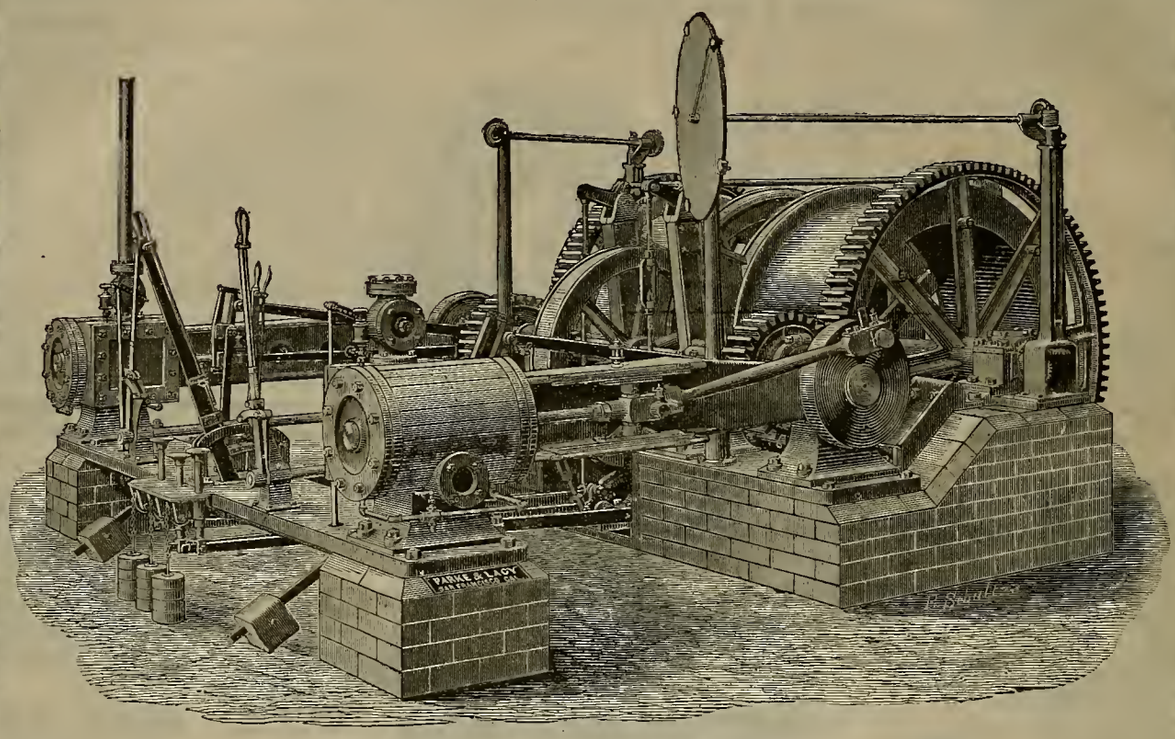

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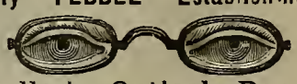
1863  1882

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, FEBRUARY 11, 1882.

VOLUME XLIV Number 6.

Portable Ore Furnace and Reducer.

The engraving herswith ropresents an apparatns for ths pnrpose of redncing mstalliferous ore. It may be made sithsr stationary or portahls, and of any rsquired oapacity. It admits of modification or variation in its form without dsparting from ths ssential principlss of constrnction nccessary to prodnce the required rsnlts.

The designsr is James Bujac, of Catonsvills, Baltimore connty, Maryland. Tbe form shown in the engraving is a portahls redncer. This consists essentially of an ontside csse mads of hoilsr iron, properly put together; an enclosed ore cylinder, furnishsd at its nppsr end with a feed door and hopper, and a safsty valvs for the exit of vapors, and at its lower end with a discharge door, a retort for ths distillation of hydrocarhons, a pips for conducting the vapors arising from the hydrocarhons to ths cylindsr, and suitahls furnaces for heating the ore cylinder and rstort. The figure is a vertical section of the portahle reducsr.

A rsprssents ths ore cylindsr placed in the cnntsr of the cass at the proper angls of inclination, so as to admit of its heing charged and discharged at will, and provided at its nppsr end with a feed door or slide, *C*, surmounted hy a boppsr, *B*, for the reception of ores. Its lower extremity is fitted with a hinged discharge door, *a*. It is also provided with a safety valve, *D*, to allow the escape of the vapors, which otherwise would accnmulate in its interior, and also to prevent the ingress of atmospheric air. When the slide, *C*, and door, *a*, are closed, the cylinder forms an air-tight or closed compartment for the treatment of ores.

Beneath the cylinder is a fire-hox, *H*, fnrnished with a grate, *I*, ash-pit, door, damper, etc. The prodncts of comhustion arising from the fire, heing deflected hy the flne hoard, *F*, are made to pass through the center or return flues, *E E E*, over the top of the cyllnder, *A*, and escape through the stack, *G*.

The semi-cylindrical retort, *K*, is nnder the cylinder, *A*, and is closed hy a hinged door, *P*, for the introduction and removal of the suhstances snhjected to distillation. This retort, *K*, ie also provided with a fire-hox, or furnace, *M*, and return flue, from which the prodncts arising from the comhustion of the fuel are made to pass into the flne, *E*, of the cylinder, *A*, and thence into the stack, *G*, as common to both.

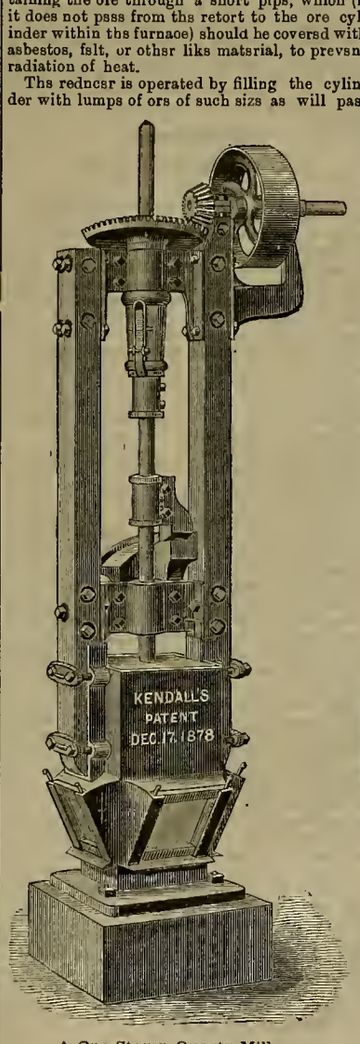
The retort, *K*, is connected to the cylinder, *A*, hy a pipe, *S*, taking the vapors from the retort at *L*, and delivering them within the ore-cylinder at *R*. This pipe, *S*, is also fitted with a valve, *T*, to regulate the passage of the vapors arising from the distillation to pass into the ore-cylinder, *A*, and also a valve, *U*, through which the vapors may he allowed to pass or escape into the air at will. The pipe, *S*, is covered with ashestos.

The cylindsr, *A*, heing filled with ore is heated to the proper temperature, and this temperature varies with the ores to hs treated. The vapors (the whole product), arising from the decomposition or destructive distillation of the hydrocarhons placed in the retort, *K*, having heen suhjected to a high temperature, are caneed, while thus hot and in a nascent state, to pass directly from the retort, *K*, in which they are generated, through the pipe, *S*, into the ore cylinder, *A*, which is filled with ore at the proper temperature, and from which atmospheric influences are excluded. By this means the metallic compounds are quickly reduced to the metallic state without heing melted. The matrix gangue and earthy suhstances are entirely redneed to powder, or rendered so friahle that their disintegration is easily effectsd hy any ordinary or inexpensive crusher.

The inventor, in his specification, statss that this invention may he carried into effect hy the apparatus herein described, either stationary or portahle, or hy any modification of it which will operate on the same principle to apply the products arising from the distillation of hydrocarhons in their crude state and highly heatsd, which condition he says he has found to he essential for the disintegration of quartz rock hy the agency of hydrocarhon gases.

It is ohvious that ths most convsnisnt mode of applying thess products, crude and heatsd, is to convsy them dirsctly and immsdiatsly from the gensrating rstort to the cylindsr containing the ore through a short pips, whioh (if it does not psss from ths retort to the ore cylinder within ths furnace) should he coversd with asbestos, fslt, or othsr liks matsrial, to prevsnt radiation of heat.

Ths redncsr is operated by filling the cylinder with lumps of ors of such sizs as will pass



A One-Stamp Quartz Mill.

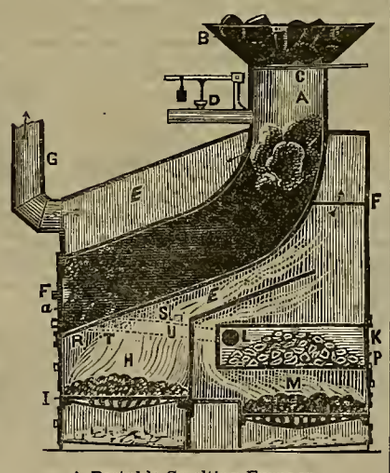
into the cylinder through the slide door into the hottom of the hopper. All the apertures hsing closed, this cylinder forme an air-tight compartment. The retort, heing charged with the hydrocarhon, is then heated to a high temperature hy means of its furnace, and the vapore evolved or arising from the distillation are caused imine-diately at the moment of their generation, and at the high temperature required to liberate them (hence acquired and possessed hy them in this incipient and newly-horn condition), to pass immediately from the retort into the ore cylinder, expelling the atmospheric air, which passee out through the automatic escape valve.

The fire heing now lighted in the furnace of the ore cylinder and the ore heated to the propsr temperature (which temperature varies with the nature of the ore to he treated), and the valve on the connecting pipe heing so adjusted as to allow the hydrocarhon vapors from the retort to pass into the cylinder in such quantities as will produce an interior prssure on the valve snfiicient to overcome the exterior resistance, thus raising the valve and allowing and insuring the expulsion of the vapore formed, a continuous flow of the hydrocarhon vapors through the ore cylinder is maintained, keeping the heated oree in contact and surrounded with a moving current or atmosphere of the hot or newly-generated vapors arising from the distillation of the hydrocarhon going on in ths rstort, and direotly and immediately passing from the said rstort into ths ore cylindsr, without detsntion or detsrioration. By this processs, the mstslliferons compounds are reduced to ths metallic state, and ths earthy or rocky matrix is reduced to powdsr, or rendsred so friahle as to nssd hut a slight or inexpensive orushsr for its furthsr reduction.

In describing this furnace and its opsration, we have nssd the language of the invsntor in his patsnt spscification. Tbe patsnt covsrs, in an apparatns for reducing orss, the comhination of a hydrocarhon rstort and an inclinsd ors cylinder having ths close feed door and a safsty valvs at its uppsr end and a discharge door at its lowsr end, and a snitable connection hetween said retort and the cylinder.

The New Sugar Refinery.

In Sprecksls' nsw sugar refinsry the large main huilding is 10 stories high in parts and 12 in others. Seven millions and a half of hricks wers used in its construction. Thers are, in fact, thres huildings—the rsfinery proper, ths char house, 12 floors high and 86 ft. wide, and the boilsr house 187x80 ft., all three having 400 ft. watsr frontags, and all the stories having douhls floors for strength and durahility, while the hassment, intended for machinery and pumps, is of concrete. From the second floor goods will he delivered into railroad cars. The third floor will he used for packing sugar, the fourth for cen-



A Portable Smelting Furnace.

trifugal machinery. The fifth floor will he nsed for mixing sngar for the centrifugal machines, and the sixth and seventh stories for various other purposee, while on the eighth floor will he the vacuum pan for condensing syrup, 43 ft. high, and reaching to the 12th floor. The walls of the refinery are three ft. thick at the hase and taper to 16 inches at the top. A warehouse will be huilt hy the side of the refinery, in which will hs pans for melting sugar, which will be pumped to the summit of the huilding, whence it descends in a liquid state through sorens and filters. The filter-house is 12 floors in the rear and ten in front. The hoiler-room is 187x80 ft., and contains 22 hoilere and space for 22 more. There is a main smoke-culvert rear of the hoiler-house for receiving gas from the hoilers, the gas to he utilized ae an economizsr for wood. The chimney is 27 ft. square at the hase and 168 ft. high. The machine shop, for holding and repairing the machinery and implements of the establishment, is 80x40 ft. Work was hegun last May and will he finished next Septemher. When completed, the whole building, machinery and fittings will have cost over $1,500,000.

THE track of the Southern Pacific is laid 204 miles east of El Paso.

Foundry Notes.

The Ætna Iron Works, Fremont strest, are vsry husy just now on a lot of miscsllaneous and small work; in fact, husisr than for some months, although the work comprises no large, special single johs. Among other things they are making a large quantity of artesian well tools to go to Texas for ths Southsrn Pacific R. R. Co. Thess consist of hits, angers, sand pumps, etc., for an sight-inch well. They ars also huilding a 12x24 Msysrs' cut-off engins, and doing considerahle city work.

Among othsr things on which tbey ars engaged is a lot of sxhaust piping for the new sugar rsfinery of Claus Spreckels. This is oast iron pips of 20 inches in diameter. The iron work for this rsfinsry has besn divided up mors or less among the locsl foundriss, and the Ætna has had its share among the othsrs.

Some of the ironwork for this refinsry was huilt in ths East, hut a good deal has heen done hy the fonndries here.

The Ætna Iron Works have recently taken in hand ths manufacture of the Ksndall one-stamp mill. Although ws havs hefors pnhlished the engraving, ws reproduce it hsre, as it has now hesn proved successful, quits a numhsr being in uss, and is now to hs more sxtensively introdncsd. There are threes of thsse mills in Arizona, two in Nsvada county Cal., three in Amador county, two in Tuolumne connty, several in thie city and in many mining camps in this State, Nevada, Montana, Idaho, Britieh Colnmhia and Arizona, mainly for working gold ores. Ahont three yeare ago the New York & Hondnras Rosaria mining company, of Honduras, S. A., ordered a No. 1 Kendall mill, and after working it for one year, ordered three more; and in Octohsr, 1881, seven more—making in all 11 mills now in opeiation on thie mine, which spsaks weil for the estimation in which it is held.

Kendall'e improvement is radical, and conеists in the ingenious and novel construction of the cam, and also in a peculiarly shaped tappet which is secured to the stem of the etamp, so as to revolve with it at the same time that it is lifted. The cam is a plain curved incline, mounted on a ruhher cushion to prevent jarring. The stamp is raised by the tappet rising on the curved cam, and as it drops off the cam a grinding opsration is produced hy the rotation of the stamp until it is again lifted. Thie ingenioue arrangement gives both a crushing and a grinding action to the etamp—an invaluahle comhination for working gold ores.

The mortar is constructed for one stamp only; hnt there are three discharge openings fitted with screens, and the discharge is fully squal to the utmost work of the stamp. The Kendall stamp is similar to the old stamp, with the exception that it is operated hy different devices, and has the very important grinding action which we bave specified. Mr. Kendall claims that this stamp is capahle of doing from two to six times the work of the old stamp, hesidee doing work which the old stamp cannot do.

The Kendall mili is complete, and ready for instant shipment. Mills of one and three tons capacity are made in sections, and may he packed on mules. It may he used as a prospsct mill; and as the mine is developed, one stamp at a time may he added. When the Kendall mill leaves the machine shop, it is hnilt and finished, and ready to set upon a hlock, receive the helt, and hegin at once to reduce ore. One of the main iteme in the cheapness of the Kendall mill is the small cost of its transportation. For prospecting a mine, any miner can see its usefulness.

THE following miningpay-rolls for January: work have been reported: Con. Virginia, California and C. & C. shaft, $15,114; Union shaft, $12,412.50; Forman shaft, $9,128.-82; Overman, $7,546.25; Union Con., $15,465.50; Ophir and Mexican, $14,975.50; Yellow Jacket, $14,570; Sierra Nevada, $11,-453.50; Combination Shaft, $7,231.87; Hale & Norcross, $6,805.50; Gould & Curry and Best & Belchsr shaft, $10,002; Savage, $1,415; Utah $5,955.75.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Eads' Ship Railway.

Editors Press:—Who believes in the practicability of the inter-oceanic ship railway? I have answered this question in private until I am tired of it. I wish it distinctly understood, that my only interest in this matter is a scientific and professional one. The financial and commercial merits of the scheme I have neither time nor inclination to investigate.

As a partial, public and final answer to the question, I think I can say: All engineers who have taken the trouble to investigate the subject. I think it is true, also, that all engineers who have not examined it are doubtful of its feasibility. But engineers are not in the habit of expressing a professional opinion without investigation; and so far as I can discover, all engineers who have written upon the subject, have pronounced the scheme entirely feasible from an engineering standpoint.

As a matter of scientific and engineering interest, I have compiled the following authorities, who have carefully examined and endorsed the scheme. If there are engineering authorities on the other side, I am singularly unfortunate in not being able to find them:

1. Capt. Jas. B. Eads—An engineer who has never been known to fail in any of his great undertakings.

2. Nathaniel Barnaby—Present chief constructor of the British Navy.

3. Wm. John—Late scientific adviser of the committee of Lloyd's Register of British Shipping, and now Manager-in-chief of the Barrow Shipbuilding Co., builders of the steam-liner *City of Rome*.

4. George Foshury Lyster—Designer and constructor of the Alexandra docks, one of the wonders of the world; for 20 years Engineer-in-chief of the Liverpool docks.

5. John Fowler—Past President of the Institution of Civil Engineers; late Consulting Engineer of the Egyptian government; Engineer-in-chief of the Metropolitan (underground) railway of London; now constructing by far the largest bridge in the world, and recognized as one of the ablest and most experienced of living engineers.

6. E. Leader Williams—Member of Institution of Civil Engineers. He was Engineer-in chief of the Trent and Mersey canal; originator of the Anderton lift, by which a section of about 150 ft. of canal with vessel, is raised or lowered 50 ft. to make the transit from the River Weaver to the canal, or from the canal to the river. This lift has been in constant and successful operation, without any hitch, for more than seven years. The French government is now building a much larger one, and the Belgium government four still larger, on the same principle.

7. Lionel B. Wells—M. Inst. of C. E. and present Engineer-in-charge of the Anderton lift.

8. Sidenham Duer, London—A distinguished civil engineer.

9. Clark & Stanfield, London—Civil engineers who have had successful and extensive experience in lifting and handling ships.

10. Emmerson, Murgatroyd & Co.—Contracting engineers, constructors of the Anderton lift, and the hydraulic docks at Malta and Bombay.

11. W. Pierce, Esq.—Sole proprietor of John Elder & Co.'s works, Govan, Glasgow, Scotland, where many of the largest and finest steamships in the world have been constructed.

12. B. Baker—Partner of John Fowler, and one of the ablest engineers in London.

13. Francis Edgar—Fellow of the Royal School of Naval Architecture, late general manager of Earle's ship-building and engineering company, a naval architect of recognized ability.

14. Don Francisco de Garay—Who, in recognition of his eminent abilities as an engineer, has been made a member of the Legion of Honor by the French Government. He is at present engineer of the Valley of Mexico, and was sent by the Mexican Government to the Canal Convention at Paris, in 1879.

15. Wm. Sooy Smith—An American engineer and inventor of great experience and ability. He designed and constructed some of the most important railroads and bridges in the United States, and is now in charge of the tunnel under the Hudson river, it having been placed in his charge after the frightful accident at that work in 1880.

16. Edward Hartt—United States Naval Constructor—one of the oldest and ablest in the navy.

17. H. L. Fernald—Another United States Naval Constructor, of recognized talent and ability.

18. Q. A. Gilmore—Lieutenant Colonel Engineers; Brevet Major-General; President of the Mississippi River Commission, and author of numerous engineering and scientific work, an engineer of world-wide renown.

19. Henry Flad—A distinguished civil engineer and President of Public Works in St. Louis.

20. O. Chanute—An experienced and accomplished civil engineer, Superintendent of the Erie railway.

21. Commodore R. W. Shufeldt, U. S. N.—The accomplished officer who surveyed the Isthmus of Tehuantepec.

22. Colonel C. Shaber Smith—A well-known and able civil engineer.

23. B. H. Harrad—Member of the Mississippi River Commission, formerly State Engineer of Louisiana, an engineer of acknowledged ability.

24. General G. T. Beauregard—Formerly a member of the U. S. Corps of Engineers.

25. E. L. Corthell—Engineer of the bridge across the Mississippi at Louisiana; and of the Soy Island Improvement Works; and resident engineer at the jetties until their completion.

26. H. D. Whitcomb—Civil Engineer, in charge of the improvement of James river. He was sent to Europe by the U. S. Government to study the improvements at the months of rivers there, and to report upon the jetty system.

27. Chas. R. Suter—Major of Engineers, U. S. A., the able and accomplished engineer in charge of the improvement of the Missouri river.

28. A. Dempster—City Engineer of Pittsburg, an engineer of extensive practical experience.

29. Max. E. Schmidt, C. E, member of the American Society of Civil Engineers; for several years resident engineer at the jetties; afterwards in charge of important improvements on the upper Mississippi, and now engaged in the construction of one of the Mexican railways—an engineer of acknowledged ability and standing.

30. E. A. Fuertes—Dean of the Department of Civil Engineering, Cornell University; and chief engineer of Commodore Shufeldt's surveying expedition in 1872.

31. Capt. Silas Bent—Formerly of the U. S. N.; a gentleman who has devoted much study to the winds and currents of the ocean; the region of calms in the Carribbean sea and in the Pacific ocean.

32. Sir Edward J. Reed, K. C. B., M. P.—Sir Edward Reed is a member of Parliament, and was for many years chief constructor of the British navy. He was made a Knight Commander of the Bath in recognition of his eminent abilities as a naval architect. He is a Fellow of the Royal Society; member of the Institution of Civil Engineers, and of Mechanical Engineers; Vice-President of the Institution of Naval Architects; member of the Liverpool Literary and Philosophical Society; author of "Ship-Building in Iron and Steel;" "Our Iron-clad Ships," and many other able engineering papers; for a long time editor of *Naval Science*; and unquestionably the highest authority in the world on this subject. Many other eminent names could be given but the foregoing are sufficient to show the highest engineering authorities in the world are outspoken in its favor.

There may be no lack of good reasons why the ship railway should not be constructed, but difficulty in safely taking ships with their cargoes from the water, transporting them by rail across the Isthmus, and launching them once more upon the ocean, is not one of them, as anyone moderately versed in mathematical and mechanical science can readily demonstrate; and the weight of opinions and the force of possibly legitimate arguments against the scheme are diminished, if not entirely destroyed, when coupled by their authors with an objection, showing either want of principle or gross ignorance of the question under discussion.

A. B. Bowers, C. E.

Smelting Ores in Inyo County.

Editors Press:—The building of the Carson and Colorado railroad through Owens' River valley sometime during the present year, will open up one of the finest opportunities for the investment of capital in smelting works for the reduction of silver lead ores to be found on the Pacific coast.

The Inyo range, from Cerro Gordo north, for a distance of 80 miles or more, contains hundreds of mining claims, and a large proportion of them show smelting ores of high grade. These ores consist of carbonates, oxides and sulphides of lead. The general formation in which these ores are found is limestone and slate. The richest ores are found in the slate, and some of them from the Swansea district, near Owens' lake, run as high as 500 ozs. of silver per ton on an average, and 40% of lead.

The ores in the limestone on the western slope of the Inyos will average from 60 to 70 ozs. of silver per ton, and 50% of lead. Most all of these ores carry gold varying in quantity from $5 to $15 per ton. Quite a large number of these claims are opened by shafts or otherwise, varying in depth from 20 to 100 ft. or more, and with from 10 to 30 tons of ore on their dumps. Some of them show first-class prospects for ore, and the best indications for large and valuable bodies.

The owners of these mines are generally poor prospectors who have held on to their claims for years in hopes that something would turn up for their benefit.

The great obstacle to working these mines has been the expense of transporting the base bullion to market, together with the cost of getting in mining supplies. The distance from Independence to the nearest shipping point on the Southern Pacific railroad is about 150 miles. The building of the Colorado & Carson road through the valley and along the very base of the Inyo range will bring most of these mines within from 3 to 10 miles of the road. The facilities for smelting these ores are almost unequaled. Wood by the million cords can be had in the Inyos at a cost of about $6 per cord delivered at a furnace, and charcoal of first quality for 15 to 18 cents per bushel. Hay, grain and general produce is raised in abundance in the valley and is sold at very reasonable prices. The Owens' river, carrying a large body of water, runs down the valley within a mile or two of the base of the Inyo mountains, furnishing an unlimited water power for driving mills and furnaces. The climate is everything that could be desired in both summer and winter. Snow never falls on the Inyos to interfere with every day work. Of course we know that it is not every mine that will furnish enough ore to run a furnace or mill, but by building large smelting works at some central point on the railroad, the ore from the different districts could be brought to a furnace at small cost and reduced.

Seven different mining districts all adjoining and along the line of this road, would furnish ores for such works. The districts (following from south to north), are Cerro Gordo, Swansea, Beveridge, Russ, Union, Deep Spring and Bishop Creek. These districts are all rich in ores of both a smelting and milling character. The ores can be purchased of the owners of the mines at fair prices, thus affording the means to develop the mines, and at the same time they can be bought at such figures as to leave a large profit to the smelter. Another advantage to be gained by erecting a smelter at a central point and buying ores, would be the bringing together of a variety of ores of different compositions, thus enabling the smelter to make combinations that would flux easily and smoothly, and save a higher percentage of the valuable metals than could be done with ore from any single mine. Such works would no doubt prove a first-class investment if skillfully and economically conducted. W.

Limiting Issues of Passes.

At a meeting in Chicago, Jan. 12, the following agreement was adopted by the railroad companies whose names are mentioned therein:

"The following agreement was this day made by and between the Chicago & Alton; Chicago, Burlington & Quincy; Chicago & Northwestern; Chicago, Rock Island & Pacific; Hannibal & St. Joseph; Missouri Pacific, and Wabash, St. Louis & Pacific railroad companies:

"1. That the issue of free passes by the parties hereto to merchants in the city of Chicago or merchants in the city of St. Louis, to be forwarded by them to their country customers, shall be entirely discontinued, and no passes shall hereafter be issued in that way.

"2. That the parties hereto shall withdraw their books of passes from Missouri river and other points, and entirely discontinue the practice of allowing their general agents to furnish free passes to merchants, not only at Missouri river points, but at all points East and West.

"The object of this agreement is to entirely discontinue the former practice of giving passes to merchants residing at any point on the various lines, or to their traveling men, it being understood that each road, through its President, Vice-President, or General Manager, may exercise its own judgment with referens to furnishing free transportation to promote local interests on its own line."

The same roads have entered into an agreement concerning passes and advertising tickets for editors and publishers, not to issue any kind of transferable tickets on account of advertising, and not to issue annual or season passes in payment for advertising to any but persons exclusively engaged on newspapers, and not in any other business. These tickets or passes are to be kept in one office or department only of each road. The last clause of the agreement is:

"Nothing contained herein shall be construed to prevent the issuance of strictly complimentary, non-transferable passes to any editor or publisher who may be actually engaged in editing or publishing any newspaper or other publication; but in such cases no notice, advertisement or other publication shall be asked for or accepted in return for said passes. They are to be fully and entirely complimentary in every sense implied by the word."

Marvelous Mining Work.—The length of the shafts and galleries in the Comstock mines of Nevada is 250 miles. During the 20 years just closed 350,000,000 tons of waste rock have been hoisted, 1,750,000,000 tons of water pumped to the surface, and the net result of all this work was $325,000,000 in bullion. We must wait until the 20th century to ascertain if the Comstock's equal has been discovered and is numbered among the mines of to-day. Whether or not such stupendous results could have been, or can be, attained by companies with non-assessable stock, will probably remain an unsolved problem.

Mining in the vicinity of the lava beds at Oroville, is being carried on to a much greater extent this winter than for a number of years past. The ground has to be stripped to a depth of from 5 to 15 ft., and usually these holes are so full of water that the Chinamen are forced to leave them. This winter the case is different, for, there being but little rain, they are not molested, and are taking out a large amount of gold-dust.

The yield of the Richmond company, Eureka, Nev., in Dore bars of silver for the year 1881, was $1,172,000. This does not include the lead turned out at the company's refinery.

Smelting Lead Ores with Gas.

The heavy expense for fuel incurred in smelting lead ores in our Western mining districts appears to be attracting the attention of inventors, and the local press, especially of Leadville, has brought out several articles relating to the use of gas obtained from cheaper local bituminous coals in place of charcoal or coke. The articles referred to set forth in an elaborate way the theoretical advantages of such a method, which no one will be prepared to dispute. The idea is by no means a new one; but numerous practical difficulties, which will readily suggest themselves to those who have had experience in such matters, have, so far as we know, prevented the execution of such plans. Possibly the best form of furnace for the working of ores with gas as fuel would be the Siemens rotator, which we had occasion to describe some time since; and probably water-gas, besides being cheap, would at the same time act as a sufficiently strong reducing agent. We have not heard that the methods proposed in Leadville have been put to any practical test, which alone can convincingly settle their feasibility; but it may not be without interest to put a brief description of them on record.

Mr. A. Stamm manufactures gas from bituminous coal, either in retorts of fire-clay or in generators of fire-brick. In either case, the tarry vapors which arise during the first hour's distillation of the coal are injected into a regenerating retort or chamber filled with incandescent coke. To accomplish this, a portion of the gas is strongly compressed in a cylinder, and the compressed gas made to issue through a nozzle in the form of a forcible jet, just where the pipe that contains the tarry vapors enters the regenerating retort or chamber. The jet of compressed gas thereby injects the tarry vapors into the glowing coke, and forces them through it. The tarry vapors are, by the contact with the latter, converted into fixed, but somewhat light, hydro-carbon gas. It differs from water-gas, inasmuch as it contains comparatively little carbonic oxide and free hydrogen, and only a minimum amount of carbonic acid. The gas thus manufactured is used with the coke for smelting.

Whatever the future of Mr. Stamm's untried gas process may be, he is sure of disappointment in his efforts at "saving fumes," and it is not likely that any one will dispute his claims to originality on that invention. In a pamphlet issued by the Stamm Smelting Co. (which is fortunate in having assigned to it the exclusive right to use this invention within the State of Colorado), we are informed that "the volatilized lead and silver, together with unburnt carbon in the form of smoke, ascend the shaft. Opposite the charging-hole there is a long, wide opening into the wall of the furnace. From this opening a large pipe goes downward to the level of what appear to be the hoshes of the furnace. Then the pipe turns inward and reaches in a horizontal direction to the inner wall of the water-jacket. At the end, it is met by a jet of compressed gas through a tuyere, thus injecting the fumes into the lower part of the furnace.

"This gas-jet must be strong enough to draw down the solid fumes (volatilized metals and carbon) and to blow them into the furnace. The gases escape through an opening in the fume-pipe half-way between the upper part of the furnace and the injecting tuyere. In this manner, the fumes and volatilized metals are returned into the furnace at the proper place, without labor, and while hot; and there is no waste of fuel in smelting them a second time."

This is the first time we remember having heard the startling theory advanced of separating fumes from gases of combustion by the ingenious method of producing a special outlet for the latter! It presupposes an intelligent discrimination, a sort of instinct, on the part of the gases of combustion which no one has ever given them credit for thus far. Mr. Stamm's idea of blowing the fumes back into the furnace, after his ingenious separation, of course, but in order to save fuel in smelting them over, requires no comment. This departure from existing notions in the metallurgy of lead is too sudden not to take away the breath of critics.—*Engineering and Mining Journal.*

It is with regret, but without surprise, says the Globe (A. T.) *Chronicle*, that we have to announce the stoppage of work on the Stonewall Jackson mine and mill at McMillan. It is believed by all who know anything of the mine, that with intelligence, it would have been paying dividends long since. A large amount of very fine ore, much of it as beautiful native silver as has ever been taken from the earth, has for several years supported a considerable mining town and population; but the stockholders have received no benefit, so far as heard from by small owners of stock.

The Idaho *Avalanche* reviews the business of Owyhee for 1881. The product of the mines of the county, with not more than 100 men constantly at work, was about $300 000. There were assessed 26,383 cattle, 11,125 sheep and 2,619 horses and mules. Total value of property, $650,259.

There is a 20-stamp mill to be built at Queen creek, about 15 miles from the Silver King mine, A. T. J. B. White, who built the Hermosa mill at Harshaw, is the contractor, and is under agreement to have the mill in running order by the first of May.

Mechanical Progress.

Mechanical and Educational Co-relation.

There is a certaio co-relation of mechanical needs, and mechaoical skill and appliances, that makes it at timea difficnlt to determine which is entitled to the credit for advaoces made in any specific direction. Chordal'a miller, who reqnired a better proof staff, had a good deal to do with edocating Chordal up to the making of ooa that wonld answer the requirements; while, on the other hand, the fact that the skill to make aomethiog nearly perfect existed, undouhtedly had quite as much to do with the miller'a demand. Neither may have had much interest, or at least more than a selfish interest in supplying the waots of the one or advancing the other in the way of skill; notwithstanding, which the relation hetween something hetter wanted and the latent ability to produce it hrought ahout hetter results, hoth in the direction of milliog, and the mannfacture of milling tools.

This is only one illnstration of the interworking of thiogs not particularly relatcd, to hring ahout results common to hoth. It is interesting to note this co-relation in its influence on the great mannfaotoriog interests of the country. The huilders of steam engines, or of machine tools, or, io fact, of any kind of machines or machioery, are supplying refined prodncts hecanse they aro called for, and they a.e called for hecaoee the skill to produce them exists or will he forthooming. There is a sympathy hetween the want and the filling of it that is imperfectly accounted for hy the law of supply and demaod.

It might at first thonght seem improhahle that there was any relation hetween the character of the products of a cotton mill, in Lowell, for instance, and the mannfactnre of standard gsuges and measuring instruments of perfection in Providence or Wilmington; hnt the fact is, the progress of the one is intimately associated with that of the other. This relation may not he altogether clearly defined, but it exists none the less, hecause it cannot he so readily traced or defined. The fact that such gauges and such instrnments can he made, has much to do with the mechanical system and order and perfection of the mill, and that system and order and perfection make it possihle to improve the qnality of the productions, and to manufaoture so cheaply as to insnre a demand. In retnrn, the want of snch a system has quite as much to do with the production of the tools and mechanical refinements which render it possihle. In this way the desire of some one who don't know what a standard gauge is like has an infloence in determining their production, while those who think they have no interest in the manufacture of cotton exert a good deal of influence in the institution, the improvements and the refinements of that husiness.

The estahlishment of one indnstry leads to the estahlishment, not only of others of the same kind, hnt to those so entirely different, that it is difficult to trace a possihle connection hetween them. It may also he seen, that, as the estahlishment of the one assists the others in gaining a foothold, so the progress toward perfection of either lifts the others upward and in the same direction.

While, as has heen said, these effects result where there is no apparent connection, and even where there might he supposed to he an actnal antagonism, it is nevertheless certain that there mnst he a real cause, withont which there is no effect.

It is coming to he hetter nnderstood that this cause is knowledge; not exactly special, or in a specific direction, hut a general fund toward which all contrihute, and from which all may draw. It is noticeahle, in this connection, how the appreciation of this fact hreaks down the harriers of trade secrets, and determines all to contribute to the general fund. Thus it is that the memhers of an intelligent community mutually help each other, and help along the general and special hosinsss prospects. A more perfect understanding of mechanical and edncational co-relation will roh husiness pursuits of the exceptional part of their selfishness, hecause it shows conclusively, that knowledge and education in an entire community tend to advance any single individnal memher.

It is one of the healthiest signs of the times that it is getting to he conceded that the proper advancement of even a special interest depends largely upon the general intelligence of all, and that, even in a purely selfish view, the hest use to make of knowledge is to spread it ae much as possihle.—*American Machinist.*

A New File should always he used with a light pressure until the very thin sharp edges are worn off, after which a heavier pressure may he used with much less danger of the teeth crumhling at the top or hreaking off at the hase. Every filer ehould keep a partially-worn file to use first on chilled surfaces or gritty skin of castings, or on a weld where horax or eimilar finxes have been employed, or on the glazed eurfaces of saws after gumming.

A New Indicator.—A Madgeburg inventor hse secured a patent upon an indicator with duplicate pistons, sprigs and cylinders, which is connected to hoth ends of the cylinder, so ae to produce a figure that ehall show the amount of work done in a oomplete douhle stroke.

New Mode of Laying Floors Suggested.

A snggestion has heen made to a contemporary of hnilding warehonse floors on the same principle as are ships' decks, so that in the event of a fire in the upper stories the damage which now necessarily ensues, hy resson of the deluge of water applied, may he obviated; in other words, let the floors of warehouses he calked, so that they shall be perfectly watertight, and whether water should be spilt hy accident, or hy design, as in the case of fire, no damage to the goods stored heneath should he done. The first thooght which occurs to one is that in the event of a hose heiog tnrned on to a warehouse upper story, the water fioding no outlet would flood the room to any depth, hut the correspondent we have referred to has forestalled this casualty hy suggesting the provision of a gutter ronod esch room communicating with pipes pierceing the walls and carryiog away the water as a rain-water pipo now does. No donht were this plan carried into effect, the first cost of erection wonld ho somewhat increased, but to the person intending to use any particular warehonse for the storage of valuahle and perishsble property, it is well worthy of coosideration whether it would not in the end "pay" to adopt the plsn, in prefereoce to having a whole chsmher full of property damaged or spoiled by the supply of water to a fire occurring in an npper room.

A Valuable Process.—A process for coating of all kinds of metals and their alloys with thin films of copper has, says *Engineering*, heen perfected by M. F. Weil, who recently exhihited several specimens of his craft at the French Academy of Sciences. The coating is done instantaneously hy a siogle copper hath at the ordinary temperature. The adherent film, which is formed of suh-oxides of copper, is often of the most heautiful colors. Steel, hrass or precious metals can thus he covered with a film of any required tint at the will of the operator, and the variety of tints is that displayed hy the phenomenon known as the "colors of thin plates." Either a single color or all the hnes of iridescence can he produced from the same hath, according to the way in which the pieces are exposed to the electric action. These colors are not, however, due to the well-known effect of thin plates, hut to the suh-oxides of copper, and the inventor supports this opinion of his hy the experimental fact that a piece of any metal whatever polychromized hy his process is immediately covered with a layer of pure copper of the richest red when treated with nascent hydrogen.

An Expanding Mandrel.—An expandiog mandrel recently introduced, consists of two parts, viz.: A rihhed split sleeve and the mandrel proper. The sleeve, which is made of steel, is pierced with a tapering hole, and one end of the mandrel is turned to exactly fit this hole. The sleeve is then turned to the reqnired diameter, preferahly on the maodrel to which it helongs, after which the material is removed in snch a way as to leave three narrow loogitudinal hearings, with equal depressed spaces hetween them. These depressions extend very nearly to the hore of the sleeve, leaving only sufficient metal to hold the hearings in position. The sleeve is cut apart through one of these depressioos, leaving it free to contract or expand. In using this mandrel, the sleeve is placed in the hole, where, hy lightly driving the mandrel into it, expansion will occnr, and tho three hearing snrfaces will he forced into sufficient contact. The contrivance is simple in construction, can he readily and inexpensively made as required for nse in a machine shop, and can also he advantageously manufactured aud sold as a standard tool.

Fires Under Boilers.—Some one has asked a cotemporry—"When a hoiler is short of water and a heavy fire is on the grate, what shall he done to prevent the hoiler from heing hurned?" An answer is given as follows: The first impulse is, on the part of some, to haul the fire at once, hut is not that the most dangerous course that could he taken? It seems open to criticism. A fire that ie disturhed, is intensely hot for a short time, at a period when no more heat is needed, and it would, therefore, seem that it would he hetter to open the doors and throw wet ashes on and smother the fire, instead of adding to the danger hy raking it over. By so doing, the heat is at once lessened —at no time increased—and the pressure is falling, hut when we haul a fire, the exact reverse occurs, more steam is made, and the danger increased. We think it is safer to cover the firee than to haul them, particularly if they are hituminous coal.

To Detect a Fault in Iron.—If a piece of iron appears to have an unsound weld, or if it has a crack apparent upon ite surface, and it is desired to know how deep it penetrates, heat the part to he teeted to a red heat and pour a fine stream of water on the faulty spot, hut mainly on one side of it, and the iron on that side will lose its redness more rapidly than the other side, and plainly indicate how deeply the defect extends.

It is said that the Bonanza King, Senator Jamee G. Fair, of San Francisco, has pnrchased the old "Whitehall" mine, in Spottsylvania county, Virginia, payiog over $100,000 for it. This mine is the continuation of the central vein of the Rappahannock mine, and the intention is to eink a shaft immediately to the depth of 500 ft., and ereot a large stamp mill.

Scientific Progress.

Facts about the Eye.

The eye is preserved in the convenient form of a sphore, or hall, hy the simple dovice of having its interior cavity filled with liquid, which prevents the limp and otherwise flexihle coats from puckering np into aoy irregularity of shspe. It is like a hladder distended with water, which is firm and tense on nccont of the contained liquid so shnt in hy the memhraneous wall that it cannot possihly escspe anywhere from the tight grasp in which it is held. Thero aro, however, in the interior of the eye two distinct chamhers in which the liquid is distrihuted, one in front of and one hehind the crystalline leos. The lens hangs, as it were, in the midst of the liqnid. The portion which is in front of the lens is a little more than a very weak aqueons solution of salt, and is on that account termed the squeous humor of the eye. The portion which is hehind more nearly rsemhles a solution of white of egg. On accont of this somewhat thicker coosistency, it is termed the vitreous, or glass-like humor. Both humors, however, exert very nearly the same iofluence upon the vihrations of the light, and the optical part of the eye thns comes to he coosidered as composed simply of two refractiog parts—the denser lens and the thinner humors.

The iris is loosely suspended in the aqueous humor in front of the lens, so that it has the water-like liquid hathing hoth surfaces, and thus enjoys the same ready freedom of movement that it would possess if it were simply immersed in water. The hnmors of the eyes are supplemsntary aids to the image-forming capacities of the lens. But they are only suhordinate aids, as their influence in this particular is comparatively small. For simplicity's sake the crystal lens and the associated humors may he looked upon as together constituting one single lens, and the visual power of the eye in reality depends upon three curved surfaces which are found in the comhination of humors and lens—the front surfaoe of the glohe or corner, npon which light in the first instance strikes as it enters the transparent media of the eye, and the front snd the hack protuherant surfaces are of the crystalline mass itself. The position of the definite image within the eye is determined hy the form of these surfaces, taken in connection with the density of the crystalline substance and its associated humors.—*Edinburg Review.*

Science in the Navy.

The Navy Department has lately adopted a policy which promises no little advantage to the service and to science. Though the navy has heen honored hy the achievements of a considerahle numher of officers of eminence in scientific investigation, no effort has heen made to encourage or assist the development of such men, the department choosiog rather to employ civilians when any strictly scientific work has heen required; and it is perhaps not too much to say that in general the professional spirit of the service has not been favorahle to scientific studies.

At the suggestion of Admiral Rodgers and Professor Monroe, of the Naval Academy, the department has now detailed five midshipmen of scientific tastes and general intelligence for duty in the Smithsonian Institution, where, under the direction of Professor Baird, they will enjoy special advantages for pursuing their studies and for receiving practical training in the work of scientific observation and investigation. The opportunities for scientifie study which our naval officers have in times of peace (which happily for the country are seldom interrupted) are constant and favorahle, hoth in home and foreign waters, and the country cannot fail to he greatly advantaged if it hecomes the fashion in the service to spend leisure time profitahly. That any loss of courage or executive ahility in war can follow from such studies is not to he imagined.

Concerning actinium, the new element, whose discovery and identification hy Dr. Phipson was recently announced, it may be said that the opinion among chemists is very largely in favor of the genuineness of the discovery. The remarkahle thing ahout it, however, ie the fact that Dr. Phipson has found it present in a comparative'y large quantity—as much as 4%—in certain kinde of commercial zinc; and the mystery is that it should so long have escaped the notice of chemists. The *Chemical News*, one of the leading journals devoted to chemistry, in an article discussing the discovery of Dr. Phipson in favorable terms, states that the quantity of actioium sulphide obtained from the white pigment amounts to no less than 4%. Thie yield is enormous. The presence of this new element in zino will account, prohahly, for the discrepancies noticed in the equivalent of this metal, as determined hy various observers. It exists, evidently in considerahle quantities in some kinds of commercial zinc.

Paris has a market for cigar etumps. In the wine saloons in the Place Mauhert are a half dozen wholesale dealers who huy the etumps from gamins and poor old people. The length of the stumps counts something in the price. Much of this tohacco is sold to workmen, and much is also exported.

Effect of Compression on Solids.

We have already referred to the effects of compression on solids, hut the following from the French *Scientific Review* gives some additional facts, which may be interesting to some of our readers:

The suhstances experimented with were taken in the form of fine powder, and suhmitted, in a steel mold, to pressures varying from 2,000 to 7,000 atmospheres, or ahout 7,000 kilograms per square centimeter. The facts observed are given in a series of tables, from which we extract some of the more curious results.

Lead filings at a pressure of 2,000 atmospheres were transformed into a solid hlock, which no looger showed the least grain under the microscopo, and the density of which was 11.5, while that of ordinary lead is 11.3 only. At 5,000 atmospheres the lead became like a fluid and ran out through all the interstices of the apparatus.

The powders of zinc and bismuth, at 5,000 to 6,000 atmospheres, gave solid blocks having a *crystalline* fracture. Toward 6,000 atmospheres zinc and tin appeared to liquefy. Powder of prismatic sulphur was transformed into a solid block of octahedric sulphur. Soft sulphur and octahedric sulphur led to the same result as prismatic. Red phosphorous appeared also to pass into the denser state of hlack phosphorous.

As may be seen from this, simple hodies undergo chemical transformations by the simple action of pressure. The chsnge of amorphous powders, like that of zinc, into crystalline maeses, is a sort of self-comhination. Certain hard metals do not lose their pulverulent structure at any pressure.

Binoxide of manganese and the sulphides of zinc and lead in powder weld when compressed, and exhihit the appearance, respectively, of oatural crystallized pyrolusite, hlende, and galena; while silica and the oxides and sulphides of arsenic undergo no agglomeration.

A certain numher of pulverized salts solidify through pressure and hecome transparent, thus proving the union of the molecules. At high pressures the hydrated salts, snch as sulphate of soda, can he completely liqnefied. Various organic suhstances, snch as fatty acids, damp cotton, and starch change their appearance, lose their texture, and consequently undergo considerahle molecular change.

Explosion of Aqua Ammoniæ.—The *Pharmaceutical Journal* records a recent case of an explosion of ordinary liquor ammoniæ, followed hy serious results. A Belfast woman, suhject to headache, sent her daughter to the druggist to purchase a small quantity of "head salts," for which he gave her liquor ammoniæ, or "spirit of hartshorn," instead of the salt, carhooate of ammonia. The vial was put on a shelf and not used for a few days. Having a headache, the woman lifted the remedy to apply it, and had it in her hand for a few minntes only when the vial snddenly exploded, scattering the contents over her face. Her eye was destroyed, and her mouth and throat hurned, the skin of hoth having heen torn off. The vial had heen put on the mantlepiece previous to the time it was used, and when ahout to apply the contents, the woman was sitting near the fire.

An Electrical Stature Alarm.—A curious application of electricity is described in *La Lumiere Electrique*. It consists in a device to prevent military conscripts practicing fraud as to their stature hy hending their knees. When the youth stands erect against the measuring post, the hind parts of the knees press on electric contacts, causing two hells to ring; the ringing ceases when there is the least hending. The sliding har which furnishes the measure, has also a contact, which is pressed hy the head, whereby a third electric hell is affected. For a correct measurement, the three hells should ring simnltaneously. This system, the invention of M. Cazala, is now employed in the Spanish army.

A New use for photography, in connection with the higher arts, has been found in the discovery that it may he relied upon to detect any restoration or tampering with old paintings. On recently examining the first proof of a well-known Madonna, in the British National Gallery, the photographer observed a disfiguring hlur over the forehead. No such hlur was discernihle in the original, except upon close inspection with the aid of a magnifying glass. The microsoope examination showed that the restorer had repaired some casual damage with a skill that reproduced the color and the texture of the painter; hut he had not nsed the same pigments, and this was instantly detected hy the suhtle chemistry of light.

Lamp hlack has heen fonnd hy M. E. Mercadier to act like seleuium in radiophony. Inetead of eelenizing one of the surfaces of the double-coil receivers, he blackens it with the smoke of an oil lamp, taking due care, however, not to carhonize the parchment paper which isolates the metallic coils from each other.

David Gill, the astronomer royal at Cape of Good Hope, has puhliehed his calcnlations of the solar parallax made for observatione of the planet Mars, in the Island of Ascension, in 1877. He makes the parallax 8.78, which will give as the mean distance of the earth from the sun, 93,080,000 miles.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jan. 19.		Week Ending Jan. 26		Week Ending Feb. 2.		Week Ending Feb. 9.	
Alpha	1.80	1¼	1.85	1.60	2	1.80	2.15	1.60
Alta	4.65	4.10	5¼	4.55	5¼	5¼	5¼	5
Andes	1	80c	90c	85c	90c	75c	70c	65c
Albion	1.90	1¼	1.90	1.80	2.45	1.65	2¼	2.10
Argenta	....	....	....	....	....	....	....	....
Addenda	10c	5c	....	....	....	....	....	....
Belcher	1½	1¼	1.45	1.30	1.40	1.15	1.10	1
Belmont	75c	....	85c	75c	80c	70c	70c	....
Best & Belcher	7¾	7¼	7⅝	7¼	7⅝	7¼	7¾	7¼
Bullion	1	50c	90c	80c	1	90c	95c	85c
Bechtel	50c	40c	50c	35c	....	....	35c	....
Belle Isle	10c	....	20c	5c	....	....	....	....
Bodie	2¾	2.45	4.10	3.35	3.80	3.20	3.55	3.30
Benton	80c	70c	1.10	70c	95c	85c	1.05	95c
Bulwer	2.60	....	2¾	....	2.60	....	2¼	2¼
Boston	50c	....	....	....	....	....	....	....
Black Hawk	6c	....	10c	5c	5c	....	....	....
Belvidere	....	....	10c	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	30c	25c	30c	....	30c	25c	25c	15c
California	40c	30c	35c	25c	30c	25c	25c	20c
Challenge	60c	55c	55c	....	....	....	40c	....
Chollar	1.10	....	1.20	1.10	1½	1.20	1¼	1.10
Confidence	2	....	1.95	1.85	2¼	2.10	2	....
Con Imperial	5c	....	5c	....	5c	....	15c	2c
Con Virginia	1¼	1	1.15	1.05	1.10	80c	75c	70c
Crown Point	95c	75c	90c	75c	1	75c	75c	70c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	10c	....	....	....	....	....
Concordia	95c	90c	....	....	85c	80c	....	....
Concordia (Wa)	....	....	....	....	....	....	....	....
Con Pacific	20c	....	35c	25c	15c	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	1	95c	1	....	1	75c	85c	80c
E. Mt. Diablo	50c	35c	50c	45c	50c	40c	45c	40c
Eureka Con	14	13	....	....	....	....	12	11¼
Exchequer	75c	70c	75c	65c	75c	70c	75c	65c
Endowment	....	....	5c	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	2.20	1.90	2¼	2	2¼	2	2¼	2
Goodsbaw	25c	....	45c	40c	60c	50c	40c	35c
Gould & Curry	4.10	3 60	....	3.80	4	3.95	3.80	3.30
Hale & Norcross	1.46	1.20	2.30	1.20	2¾	2.35	2.45	2.15
Head Center	50c	35c	90c	....	80c	75c	70c	40c
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	....	....	10c	5c	10c	5c	5c	....
Justice	75c	65c	1.05	80c	1	90c	1.10	95c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	80c	....	20c	....	....	....	80c	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	15c	....	15c	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1¼	....	1¼	....	....	....	....	....
Martin White	2¾	2¼	2¾	....	3	2.95	3⅜	3.20
McClinton	....	....	....	....	....	....	....	....
Mono	70c	....	1.85	1	1.45	1.05	1¼	1
Mexican	10⅜	9½	10¼	9⅜	10½	9⅜	10⅜	9¼
Mt. Diablo	8	7½	8¼	7⅜	8	7¼	7⅝	....
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	10c	....	10c	....	30c	5c	25c	20c
New York	....	....	....	....	....	....	....	....
Northern Belle	8¼	7¼	10	8⅜	10¼	9⅜	11	10½
North Noonday	....	....	10c	5c	5c	....	10c	....
Navajo	60c	40c	65c	55c	65c	....	60c	55c
Occidental	....	....	....	....	....	....	90c	....
Ophir	6¾	5¾	6¾	5¾	6¾	6	5¾	5¾
Original Keystone	....	....	....	....	....	....	....	....
Overman	1	90c	1.20	95c	1.10	95c	1¼	76c
Oro	1	10c	15c	10c	15c	10c	30c	10c
Paris	....	....	1	....	....	....	....	....
Potosi	1¼	1.35	1.45	1.40	1.70	1¼	1¼	1.40
Queen Bee	....	....	5c	....	....	....	5c	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1½	1.35	1.60	1.30	1.70	1.60	2.10	1¼
Seg Belcher	....	....	....	....	4.90	4½	5.55	5¼
Sierra Nevada	8¾	7¾	9¾	....	9¾	8	9¼	8¼
Silver Hill	20c	10c	25c	20c	20c	....	10c	....
Silver King	19¾	19¼	19¾	19	....	....	19	18¾
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	10c	....
Scorpion	1	90c	1	95c	1.05	95c	95c	90c
Solid Silver	....	....	....	....	....	....	....	....
Soutb Bodie	....	....	5c	....	10c	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	20c	....	....	....	25c	....	25c	....
Tioga Con	....	....	15c	10c	15c	10c	....	....
Tiptop	5	4¾	4¾	4¼	4¾	4.20	....	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	11⅛	10¾	11⅛	10⅜	11⅛	11	11⅛	10¾
Utah	5⅛	5¼	5⅜	5¼	5⅝	5⅜	5⅜	5
Ward	3¼	....	3.60	3⅜	3¾	....	....	....
Wales	70c	....	80c	75c	75c	....	....	90c
Yellow Jacket	2.90	2.60	2.90	2.60	3	2.65	2.55	2.15

Sales at S. F. Stock Exchange.

Thursday A. M., Feb. 9.

50 Alpha.....2.05
1415 Alta.....5¼@5
20 Andes.....70c
60 B & Belcher.....7¼@7⅜
990 California.....20c
1535 Con Virginia.....75@70c
50 Chollar.....1¼
150 Crown Point.....75@70c
230 Con Imperial.....10c
100 Caledonia.....15c
100 Challenge.....40c
450 Exchequer.....70@65c
150 Golden Gate.....2
505 Gould & Curry.....3.30
410 Hale & Nor.....2.15
2000 Justice.....1
500 Julia.....5c
100 Kentuck.....80c
555 Mexican.....10⅛@10
250 Ophir.....5¾@5⅝
1110 Overman.....1.20@1¼
50 Potosi.....1.40
165 Sierra Nevada.....82
220 Savage.....1.85
25 Scorpion.....90c
60 Utah.....5
225 Union.....11@11⅛
10 Ward.....3¼
630 Yellow Jacket.2.20@2.15

AFTERNOON SESSION.

50 Albion.....2.20
50 Bodie.....3.40
230 Belding.....25c
160 Bechtel.....40@35c
150 Bulwer.....2.60
100 Boston.....45c
50 E Mt Diablo.....35c
20 Eureka Con.....11¼
200 Eureka Tunnel.....1¼
350 Gen. Jackson.....1@1.10
100 Manhattan.....1¼
20 Mono.....1
300 M White.....32
150 N Noonday.....30c
55 Northern Belle.....11@11¼
450 Oro.....25c
200 Southern Nev.....5
200 Tioga Con.....10c
300 Wales.....1

SUTRO TUNNEL.—In the report of progress of the Sutro tunnel, the superintendent says: At about 6:30 o'clock A. M., Jan. 31, connection was made with the drift made by the Overman Co. from a point 200 ft. west of the Foreman shaft. The connection wae an excellent one and a credit to the engineers who ran the lines, Messrs. Specht, Craven and Wrinkle. The Overman drift was somewhat too high, but can be easily remedied by cutting it down to the proper grade. Distance from Julia turning point at last report, 6,142 ft.; driven since, 100 ft.; total, 6,242 ft. Distance of point of connection from Yellow Jacket turning point, 2,603.23 ft.; to a point 200 ft. west of the Forman shaft, 816 ft. The *Enterprise*, in speaking of the statement that the bottom of the drift must be cut down says: This is not because the survey was not exact, nor does it in any way detract from the exactness of the connection. The workmen purposely left the floor a little high as they approached the point of connection, in order that the water might flow back toward the shaft.

THE colored population of Nevada ie less than 400. There are 5,416 Chinese and 2,803 Indians in the State.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	15	50	Jan 6	Feb 9	Mar 2	W Willis	309 Montgomery st
Andes S M Co	Nevada	18	25	Feb 2	Mar 9	Mar 30	B Burris	309 Montgomery st
Belcher S M Co	Nevada	29	50	Feb 6	Mar 11	Mar 31	J Crockett	327 Pine st
Best & Belcher M Co	Nevada	22	50	Jan 4	Feb 7	Feb 28	Wm Willis	309 Montgomery st
Bodie Con M Co	California	1	50	Dec 6	Jan 24	Feb 23	W H Lent	309 Montgomery st
Bullion M Co	Nevada	22	30	Jan 19	Feb 21	Mar 14	J M Frazell	328 Montgomery st
California M Co	Nevada	2	20	Jan 18	Feb 25	Mar 22	C P Gordon	309 Montgomery st
Champion M Co	California	10	26	Jan 12	Feb 20	Mar 13	B Burris	309 Montgomery st
Chollar M Co	Nevada	7	25	Jan 9	Feb 14	Mar 7	W E Dean	309 Montgomery st
Con Imperial M Co	Nevada	17	10	Jan 4	Feb 8	Mar 1	W E Dean	309 Montgomery st
Con Pacific M Co	California	4	26	Jan 28	Mar 3	Mar 27	F E Luty	330 Pine st
Con Virginia M Co	Nevada	17	30	Jan 31	Mar 11	Apr 8	A W Havens	309 Montgomery st
Day S M Co	Nevada	10	50	Jan 28	Mar 6	Apr 3	E M Hall	327 Pine st
Equitable T & M Co	Utab	26	10	Feb 2	Mar 9	Mar 24	C J Collins	512 Montgomery st
Excbequer M Co	Nevada	18	25	Jan 12	Feb 15	Mar 6	C E Elliot	327 Pine st
Gould & Curry S M Co	Nevada	41	50	Jan 12	Feb 16	Mar 9	A K Durbrow	309 Montgomery st
Hale & Norcross M Co	Nevada	72	76	Dec 21	Jan 25	Feb 16	J F Lichtner	309 Montgomery st
Julia Con M Co	Nevada	17	20	Jan 17	Feb 24	Mar 16	H A Charles	419 California st
Mariposa Land & M Co	California	22	25	Dec 23	Jan 31	Feb 28	L Leavitt	309 Montgomery st
Martin White M Co	Nevada	11	25	Jan 20	Mar 2	Mar 30	J J Seeville	309 Montgomery st
Mono G M Co	California	16	30	Feb 7	Mar 14	Apr 3	W H Lent	309 Montgomery st
Monumental T & M Co	Nevada	1	05	Dec 30	Jan 31	Feb 21	D B Cbiaholm	327 Pine St
Napoleon M Co	California	1	03	Jan 13	Mar 2	Mar 23	H Smith	309 Montgomery st
New York M Co	Nevada	27	15	Jan 18	Feb 21	Mar 13	F E Dietz	327 Pine st
Noonday M Co	California	5	25	Dec 30	Feb 8	Mar 2	W J Taylor	310 Pine st
North Noonday M Co	California	5	25	Dec 30	Feb 10	Mar 6	W J Taylor	310 Pine st
Nortb Standard G & S M Co	Cal	2	10	Nov 30	Feb 1	Feb 20	C V D Hubbard	310 Pine st
Overman S M Co	Nevada	52	50	Jan 9	Feb 14	Mar 7	Geo D Edwards	414 California st
Rex Montis M Co	California	14	25	Jan 9	Feb 14	Mar 10	J W Ward	426 California st
San Jose M Co	Nevada	18	75	Jan 30	Mar 15	Apr 19	A Carrigan	109 Front st
Savage M Co	Nevada	49	60	Jan 6	Feb 8	Feb 28	E B Holmes	309 Montgomery st
Sierra Nevada S M Co	Nevada	71	1 00	Dec 29	Feb 1	Feb 20	E L Parker	309 Montgomery st
Spaulding G & S M Co	California	2	10	June 23	Feb 23	Mar 24	J W Pew	310 Pine st
Tioga Con M Co	California	15	10	Jan 12	Feb 16	Mar 8	W H Lent	309 Montgomery st
Tombstone Con G & S M Co	Arizona	1	02	Jan 7	Feb 13	Mar 6	J M Buffington	309 California st
Utab S M Co	Nevada	37	1 00	Jan 14	Feb 17	Msr 7	G O Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	4	03	Dec 27	Jan 30	Feb 17	J M Buffington	309 California
Bay State S M Co	Nevada	1	02	Dec 29	Feb 6	Msr 6	J W Pew	310 Pine st
Blue Bell Con M Co	Nevada	2	50	Jan 19	Feb 24	Mar 17	H P Busb	431 California st
Butte Creek Hydraulic M Co	California	8	10	Dec 29	Feb 15	Mar 6	A L Taylor	230 Montgomery st
Con Amador M Co	California	3	50	Dec 21	Jan 24	Feb 11	F B Latham	310 Pine st
Excelsior Deep Grav M Co	California	17	25	Jan 10	Feb 14	Mar 7	D B Chiaholm	327 Pine st
Fairview M M Co	California	3	1 00	Jan 3	Feb 10	Mar 2	D O McAfee	328 Montgomery st
Golden Fleece Grav M Co	California	24	30 00	Jan 31	Mar 4	Mar 23	Fr Scbirmier	785 Folsom st
Gopher Con M Co	Nevada	2	50	Jan 11	Feb 20	Mar 20	H Deas	309 Montgomery st
Maybelle Con M Co	California	10	20	Dec 31	Feb 7	Mar 1	W J Taylor	310 Pine st
Mayflower Grav M Co	California	14	10	Dec 30	Feb 3	Feb 23	J Morizio	323 Montgomery st
McElroy Grav M Co	California	10	10	Dec 20	Jan 24	Feb 11	L Lillie	607 Washington st
Oro M Co	California	11	15	Jan 7	Feb 13	Mar 7	W Stuart	320 Sansome st
Pinal Copper Co	Arizona	3	2 50	Jan 28	Mar 6	Mar 27	Geo T Sbaw	340 Fourth st
Peabody G M Co	California	3	04	Dec 31	Feb 4	Feb 25	R D Hopkins	436 Montgomery st
Rocky Point M Co	California	10	05	Jan 13	Feb 13	Mar 6	D M Ke t	330 Pine st
Sigourney G & S M Co	California	3	03	Jan 24	Feb 28	Mar 20	A Judson	320 Sansome st
South Eureka M Co	California	3	10	Jan 2	Feb 16	Mar 7	F A Berlin	420 Montgomery st
Vanderbilt M & M Co	Nevada	3	05	Jan 16	Feb 24	Mar 16	J Morizio	328 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alabama M Co	——	W H Watson	302 Montgomery st	Annual	Feb 14
Alexander M Co	——	A B Cooper	328 Montgomery st	Annual	Feb 25
Bailey M Co	——	W H Watson	302 Montgomery st	Annual	Feb 14
Cameron G & S M Co	——	W J Blattner	Stock Ex	Annual	Feb 20
Hillside M & M Co	Nevada	F Frankenthal	330 Pine st	Annual	Feb 13
Humboldt M Co	——	W H Watson	302 Montgomery st	Annual	Feb 14
Maryland Con M Co	——	E P Farnsworth	219 Sansome st	Annual	Mar 6
Murchie G & S M Co	——	W Letts Oliver	328 Montgomery st	Annual	Feb 21
Saratoga M Co	——	R W Heath	318 Pine st	Annual	Feb 22
Swansea M Co	California	M A Wheeler	320 Sansome st	Annual	Feb 18

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	California	W Letts Oliver	328 Montgomery st	20	Dec 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Feb 13
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Jan 16
Silver King M Co	Arizona	J Nash	315 California st	25	Jan 16
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Feb 13
Standard Con M Co	California	Wm Willis	309 Montgomery st	75 (extra)	Jan 12
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10	Jan 3
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10 (extra)	Jan 3
Western M Co	California	C S Curtiss	309 Montgomery st	75	Dec 22

Mining Share Market.

Businese on the etock hoards is very dull indeed. At the first session of Thursday, only 17 etocks were dealt in, and of these, 15 were Comstocks.

The lateet Comstock notee are as follows, dated the 8th: Only a few feet remain to connect the main Savage incline with the 2400 level. All work ie now being done from below, as it would he dangerous to have men working on both sides.

Arrangements have been made hy which the Alta Co. will at once start a drift south for the Justice Co. on the 2150 level. This drift will he etarted from a point ahout 30 ft. for the face of the east drift. Thie will carry it just outeide the west casing of the Woodville vein. At this point the Alta people will start a drift of their own to the northward.

Seams of quartz showing etreake of ore have been cut by the north drift on the 2700 level of the Union Con. and Mexican mines.

The following mining companies have cash on hand February 1st: Argenta, $786.08; Andee, $2,991.37; Belle Isle, $1,477.54; Crown Point, $5,811.13; Challenge, $318.84; Bodie Con., $38,345.47; Bechtel, $11,009.09; General Jackson, $5,339.43; Hale & Norcross, $14,006.66; Julia Con., $2,376.24; Juetice, $21,056.99; Mono, $1,452.76; Mexican, $1,809.82; Northern Belle, $47,104; North Belle Isle, $5,276.05; Ophir, $1,651.09; Potosi, $23,019.28; Saratoga, $7,664.94; Silver Hill, $1,360.95; Sierra Nevada, $15,534.62; Tioga, $2 119 62; Union Con., $1,380; Alta, $40,526.82; Benton Con., $6,866.49; Belding, $591.17; Lady Washington, $1,999.12.

The following companies had an indebtedness February 1st: Alpha, $6,459 45; Alhion, $4,208.13; Best & Belcher, $27,139 85; Bullion, $27,498.62; Betty O'Neal, $2,460 28; Chollar, $5,148.78; California, $73,998 33; Day, $91,438.54; Exchequer, $4,572.22; Gould & Curry, $22,594.27; Imperial, $19,363.47; Independence, $283.01; Leede, $4,536.11; Mount Diahlo, $23,094.35; New Coeo, $1,125.56; Overman, $15,624.05; Utah, $2,127.21; Con. Virginia, $16,825.35; Star, $8,784 62.

REPORTS from Mohave, Arizona, state that the mine recently discovered hy Jack Johnson promises to he the "biggest thing" in the mineral way in that whole region. Local experts still differ about the character of the ore, hut many eteadfastly maintain that it ie telurium.

Meetings and Elections.

General Jackson M. Co., Feb. 6. Directors—W. H. Sears (President), W. E. Norwood (Vice President), H. H. Al'en, George W. Fisber and Horsce Webster. R. W. Heath, Secretary, and R. J. Jones, Superintendent. It was resolved to make application to list the stock of the company on the San Francisco Stock and Exchange Board.

Sulphur Bank Quicksilver M. Co., Feb. 6. Directors—Tiburcio Parrott, D. O. Mills, Peter Donahue, W. E. Sabcock and J. W. Burling.

Standard Con. M. Co., Feb. 6. The old Board and officers were re-elected, with the exception of Washington Lee, of New York, in place of J. M. Masterton, of New York.

San Francisco Copper M. Co., Feb. 6. Directors—Jeffrey Cullen (President), Antoine Borel (Treasurer), Pelham W. Ames, M. A. De Laveaga and William Harney. R. H. Pond was cbosen Secretary, and John E. Ellis, Superintendent.

Manhattan M. Co., Feb. 2. Directors—A. K. P. Harmon, C. E Gibbs, E B. Pond, M. Curtis, R. W. Paxton.

Father De Smet M. Co., Feb. 3. Directors—J. B. Haggin (President), J. Clark (Vice-President), Thos. Brown, Thos. Bell, Thos. Menzies. H. Deas, Secretary. H. M. Gregg, Superintendent.

Holmes M. Co., 1st. Directors—A. J. Holmes, W. S. Hobart, W. E Sell, R. E. Wilson, J. E. Dixon.

California Powder Works Co. Trustees—N. G. Kittle, G. T. Lawton, J. B. Haggin, N. Luning, J. O. Earl. President, N. G. Kittle; Vice-President, G. T. Lawton; Secretary and Treasurer, John F. Lobse.

New Incorporations.

The following companies bss been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

General Miller M. Co., Feb 4. Location, Takou Co., Alaska. Capital stock, $5,000,000. Directors—William Corcoran, G. R. B. Hayes, A. J. Bryant, George E. Pilz and W. M. Pierson.

Jeannette M. Co., Feb. 4. Location, Takou Co., Alaska. Capital stock, $5,000,000. Directors—Daniel Callaghan, A. K. Durbrow, J. M. Gitchell, George E. Pilz and Wm. M. Pierson.

Jamestown M. Co., Feb. 4. Location, Takou Co., Alaska. Capital stock, $5,000,000. Directors—O. B. Jennings, Wm. M. Pierson, A. K. Durbrow, George E. Pilz and William Corcoran.

Maryland M. Co., Feb. 4. Location, Takou Co., Alaska. Capital stock, $5,000,000. Directors—Daniel Callaghan, C. D. O'Sullivan, George E. Pilz, George W. Reynolds and C. B. Jennings.

Czar M. Co., Feb. 4. Location, Takou Co., Alaska Capital stock, $5,000,000. Directors—C. D. O'Sullivan, Daniel Callaghau, Geo. W. Reynolds, Geo. E. Pilz and J. M. Gitchell.

Bryant M. Co. Location, Takou Co., Alaska. Capital stock, $5,000,000. Directors—A. J. Bryant, C. D. O'Sullivan, George E. Pilz, George W. Reynolds and George R. B. Hayes.

Germania Lead Works Co., Feb 7. Location of works, San Francisco. Capital stock, $500,000 Directors—F. W. Billing, E. E. Eyre, W. D. O Sullivan, A. W. Bowman, Joseph G. Eastland, Joseph B. Roeeborough, J. G. Kellogg, W. A. Aldrich, Lewis Gerstle.

MINING SUMMARY.

The fellewing is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

BULLION.—*Monitor-Argus*, Jan. 30: On Sunday last, the Isabel Gold and Silver Mining Co., Limited, made another shipment of bullion, to the amount of about $1,400, the product of the Stella mine.

AMADOR.

PLYMOUTH.—Cor. Amador *Dispatch*, Feb. 4: Since Supt. Robinson took held of the Empire mine, the increasing rear of her eighty-stamp mill tells but too plainly the immense amount of ore being extracted and crushed in this mill. The Pacific will have the water in in a few days, and an additional rear of forty stamps more will chime in, thereby helping to fill Plymouth's great mining cheir, and when the Alpine, the Jebns, the Aden and Weolford, and many others in enr immedlate vicinity strike the golden lyre, the music will be complete, and Plymouth, with ber golden harvest fields, and productive gardees and vineyards, will become the great mountaiu city of the Pacific coast. This is no overdrawn picture, and te-day the prespects of Plymnuth are bright for a glerious future.

STONY CREEK CLAIMS.—*Ledger*, Feb. 4: A correspondent writing from Stony creek concerning the mining interests of that vicinity says: The New York mine, located on the south side of Jackson creek, one mile south of Kittridge's mine, has lately struck a ledge ten ft wide, of good milling ore, and still the crosscut bas not reached the foot-wall. The owners feel quite elated over these prospects, and improvements will be erected as soon as circumstances require. The Kittridge claim is lying idle for lack of capital to develep it. I am inclined to think there is bardly a better prospect to be found in Amador couuty. There is a large body of rock of good quality in sight, sufficient to keep a mill running for a lengthened period. Capitaliste bave an idea that there is nothing worth looking at in the way of a mining claim unless it is located on what is known as the mother lode. But judging from the formation, and the developments already made, I believe there is not a better region for the iuve tment of capital in this county than the belt of which I am speaking. The formation is slate, and the ledge runs a little west of north, the quartz being very prominent, and traceable for a long distance. Claims are being located very fast.

KEARSING.—This mine, located in Jackson, and owned by Ginocchio Brothers, is having the water taken from the shaft, with a view of being examined by experts in the interest of capitalists below, who are thinking of purcbasing it.

GOLDEN GATE.—The Golden Gate mill, after long waiting for water, was at last started up on steam, and the stamps are now pounding away, after a silence of nine months.

PINE GROVE.—Mining operations at Pine Grove are looking up. Mr. Wheeler and another man have recently taken up a quartz claim on the Grass Valley creek below Dane's mill, which prospects for 600 ft along the croppings. They propose to put men immediatcly to work taking out rock and crushing the same at Dane's mill. Capt. James White, Supt. of the Providence Con. G. and S. M. Co. finds his recent purchase exceedingly promising. They have 3 claims near Pine Grove. Wm. Doyle visited them this week, and reports the Nabob looking splendidly, with a ledge 4 ft thick. Forty tons of rock have already been taken out, which prospects $25 per ton. Grading for a mill and boisting works is now being vigorously prosecuted.

BUTTE.

PROSPECTING.—Oroville *Mercury*, Feb. 5: A report is abroad that E. J. Davis and Major McLaughlin, in conjunction with Messrs. Braken, Benson and others are preparing to take water from the Miocene ditch for piping on mining ground near Nelson Bar, opposite the Curtis ranch. There has been a good deal of tunneling and prospecting in the vicinity for the past 25 years, and it is believed there are millions of gold there, but that it can be obtained only by hydraulic mining. They propose to prospect it.

CALAVERAS.

THE BLACK OAK.—Angels *Echo*, Feb. 2: The proprietors of the Black Oak mine, Messrs. Osborn & Fisher, have recently erected a dwelling-house on the mine and have made other necessary preparations for working the mine systematically. This mine is situated 3 miles northwest of Angels, and is said to be one of our richest quartz mines. The proprietors tell us that in prospecting on the main lead last week, as bigh as $3 to the pan was obtained.

RICH MINE.—A gentleman who visited the Potter mine near Angels recently, says be went down the shaft, which is over a hundred ft deep, and found the main vein to be from 0 to 14 ft in width. The ore averages from $14 to $15 per ton, and can be obtained at a small outlay. The proprietors are stoping, and are getting out quartz very rapidly. Overhead is a vast body of ore, which it is estimated will produce from $30,000 to $40,000, and over 300 tons is now on the dumps, ready for crushing.

MURPHYS ITEMS.—The Red Wing mine is working day and night, and turning out most beautiful rock. This mine is one of the group of mines owned by the Ora Plata Mining and Milling Co, and is a valuable piece of property. The company own several good mines in the immediate vicinity of Murpbys, and with the mill in full operation, employ a large number of men. The mill is now idle, owing to the failure of water supply. The Union Water Co.'s ditch must have frozen up nearly solid at its head; we have seen no time within the last 3 years when there was such a scarcity of water as now, and bave any at all.

EL DORADO.

CLEAN-UP.—Georgetown *Gazette*, Feb. 3: A partial clean-up was made in the Eureka mill last Saturday, the result being highly satisfactory to all. The run is being made on what is considered the poorest ore on the dump, which, if it is now believed, is yielding at least $7 in free gold to the ton. There appears to be about 1 ton of sulphurets to 7 or 8 tons of ore, which Mr. Powning, the mill operator, informs us will yield $60 or more per ton. This places the ore at about $15 per ton, which, we understand, is near the results of the mill tests which Mr. Baird had made from the ore shipped to the East last summer. There are about 1,000 tons of ore on the dump, enough to keep the little mill running more than two months. So far the new crusher and grinder (unlike any mill on this coast), is giving entire satisfaction, but the mill has not yet been sufficiently tested to prove its durability. Upon a trial test 1 day last week, 1,700 lbs. of ore was put through the mill in 1 hour. This would give more than 20 tons in 24 hours, but we think 17 tons in 24 hours is all that the mill can crush of this hard ore and do good execution.

EXTENSION.—When a big pocket is etruck or a mine is discovered which promisee to be a good property, how natural it is for people to flock in and locate every foot of the adjoining ground, and too, in most cases, without a color in rock in place. We believe this is a good thing when the locators take hold and prospect their claims with earnestness, for sometimes mines are thue found eurpassing the original. The extensions of the Eureka have been taken up, and before another year we would not be surprised at bearing of important developments made on that line.

STEAM UP.—El Dorado *Republican*: The Placerville Gold Quartz mine ebut down for a few days, hoping that a water eupply would eoon be forthcoming, but as the prospect began to look dubious, steam was got up and work proceeded with as usual.

INYO.

COSO EAST.—Inyo *Independent*, Feb. 4: Roy Cook, one

of the owners of the Mountain Chief mine, located in Coldwater canyon, 12 miles northeast from Bishop Creek, passed through Independence last Monday on his way to St. Louis. His trip East is in the interest of the Mountain Chief and the adjoining property, the Valley Queen mine.

LOOKOUT.—Frank Fitzgerald returned to the Modoc region from San Francisco on the 30th ultimo. He is still lessee of the entire property, and at present has a working force of 14 men, which may be increased to 50 within 10 or 12 days. Some 45 tons of ore were extracted while he was in the city.

BONDED.—Without being able to give the figures, we may state that the famous Kearsarge property has been bonded for 4 months to Dr. S. H. Squire, of Gold Mountain. It is understood that in the meanwhile the bonding party will carry on extensively the work of developing the mine, and at the end of the time has the privilege of buying it or not.

INYO CONSOLIDATED.—Everything is running here splendidly, although the weather has caused a number of the old weather-cocks of Panamint to predict that it would be impossible to run the mill at all. This successful run in the middle of winter, with snow and frost to battle against is really astonishing. The mill is running steadily to its fullest capacity, and working the ores closer than has been done heretofore. Some time in the future I will give you figures. Nearly all the company's ore that was at the mill has been crushed. Will commence tonight on Martin Mee's and Judge Russell's ores. After that Messrs. Robert Mitchell, J. A. Lee and Isaac Wagner will send through a number of tons of rich chloride ores, taken from some of their best claims. Their ore will no doubt work $300 per ton. The Deputy Recorder for this district has recorded about 40 claims since the 1st of January. A party of Eastern men are expected here tomorrow, who will look around and no doubt interest themselves in this camp. For the past few days it is not unusual to see from 2 to 5 men, principally prospectors, coming into our camp, eager to take chances and help develop this the great mineral region.

BROWN MONSTER.—Alex. Clarke's contract for cleaning up the Brown Monster mill has been retarded by the cold snap, which prevented a run of water in the big ditch.

BORAX HUNTERS.—Billy Hedges and Wal. Phillips are off on an excursion to Saline valley, ostensibly on a hunt for horse flesh.

REX MONTIS.—Supt. Holt is engaged in putting the Rex Montis mill in perfect order for work during the coming season.

MARIPOSA.

BULLION.—Mariposa *Herald*, Feb. 3: A considerable quantity of bullion is being occasionally shipped from the silver mines below town. It is of a very fine quality, and is worth about $3 per ounce. The last shipment was about 50 pounds. We learn that the Reed Talc mine is undoubtedly a success. The patent pulverizer recently put in has a capacity of pulverizing about 30 tons of talc per day. The mine is operated by the Shreve company. The Marble Spring or Compromise mine is now owned by a company who have a 10-stamp mill on the premises. A pocket was struck in the mine some week or 10 days ago which is said to have been very rich. Excellent rock is now being taken from the Peter Longhurst mine, on Bull creek. A quantity will soon be crushed as a test of its richness. It is the general opinion of those acquainted with the ore that this mine will be a good-paying enterprise. The *Star* learns that 1 day last week 2 Austrians who were mining in the hills near Hornitos came across a pocket out of which they realized over 230 ounces in gold. The vicinity of Hornitos is rich with these pockets, as thousands of dollars have been taken from the placer mines of that district.

MONO.

BODIE.—*Free Press*, Feb. 7: We expect that the Standard will find an ore body of great importance at depth. This expectation is based on the theory that a ledge formation does not lose itself as depth is attained. Sometimes barren country is encountered in a mineral zone, yet the distinctive character of gold and silver remains. During the past week good headway was made in the Oro shaft, and the Noondays took out considerable ore. Prospecting from the Red Cloud shaft still continues. The Lent shaft is the scene of activity, and it will not be long before crosscutting will be going on. Below will be found our usual weekly summary of operations in this district.

STANDARD CON.—During the past week there was extracted and shipped to the mills 1,300 tons of ore from the 385, 500, and 550 levels. The average pulp assay for the week was $14.41. The amount of bullion shipped to San Francisco was $59,817.88. The stopes are looking well as usual. The ledges continue to hold their usual width.

BODIE CON.—During the week ending the 4th there were 74.975 tons of ore hauled to the mill, and 73 tons were extracted from the mine. The mill crushed 91.08 tons. The average pulp assay was $70.06 per ton. The shipment of bullion amounted to $8,227.60.

TIOGA.—The quartz mentioned in the last report still continues to improve.

BONNE TUNNEL.—Ore is being extracted as usual from the north and south stopes.

OHIO.—During the past week the main shaft has been sunk and timbered 22 ft, and it is now 723 ft deep. The rock has been much softer.

UNION CON.—The south drift on the Bonner lode has been advanced 13 ft; total length 119 ft. The ground in the face is breaking well.

BOSTON CON.—The winze below the 400 level has been sunk 7 ft; total length 20 ft. The vein is 2½ ft wide.

RED CLOUD CON.—West crosscut, 600 level, was extended 10 ft during the week. Good progress is being made in cutting out the station for the hoh of the 700 level. All the machinery is working well.

CON. PACIFIC.—The north drift on the 130 level has been advanced 14 ft; total length, 07 ft. The face is in a good formation, and prospects well in gold.

GOODSHAW.—The east crosscut on the 750 level has been advanced 14 ft during the past week. The formation is favorable. A strong flow of water continues.

NORTH NOONDAY.—Ore from the 312 and 412-ft stopes has kept the mill fully supplied during the past week.

NEVADA.

STRUCK THE CHANNEL.—*Tri-Weekly Herald*, Feb. 2: Yesterday the workmen at the Gold Spring mine struck the gravel channel, and the prospects are very encouraging. The owners feel somewhat jubilant and anticipate soon making some rich developments in their mine. We hope they will, as they have been very energetic and have kept up work for a long time. The present tunnel is in 1,360 ft., and 3 years' time has been consumed in running it. The stockholders have expended considerable money and it is now time they were getting some return.

WILL BEGIN DRIFTING.—Drifting in the Sargent & Jacobs claim at Quaker Hill will be resumed as soon as the shaft is pumped free of water and a new pump put in. At present the claim lies idle.

HOMEWARD BOUND MINE.—Grass Valley *Union*, Feb. 5: The water in the incline shaft of the Homeward Bound mine (Menlo Co.) has been pumped out, to the depth of 270 ft. An additional compartment to the shaft is being constructed, which, when completed, will give the shaft 3 compartments—two for track-ways, and 1 for pump and ladder way. At a depth of 233 ft in the shaft a station is to be cut out, when a tunnel will be immediately started to connect with the tunnel being driven in from Wolf creek. The tunnel on the Wolf creek end is now in a distance of 160 ft, and about 1,300 ft will have to be run to make a through connection. With this work going on at both ends good progress in construction will be made. Mr. Bethell has just completed the necessary surveys for the tunnel. A tunnel is also to be extended from the Homeward Bound shaft into the Wisconsin ledge, which is a parallel vein.

GOOD ROCK.—The Eureka No. 2 quartz mine, near Nevada City, which is under the superintendence of John Trenberth, is turning out some fine-looking rock from the drift at the depth of 125 ft. It shows well in coarse gold and auriferous sulphurets. Mr. Trenberth says the rock will go $100 per load. The ledge is of an average width of 8 inches. The last crushing from the mine yielded $60 per load.

PLACER.

DAMASCUS.—Placer *Herald*, Feb. 4: G. W. Snyder, of Damascus, one of the owners in the famous old Mountain Gate drift mine, informs us that the old mine is still paying first rate, the product of last week's work being about 75 ounces. Where they are working at present, in the deeper blue gravel channel, the water has to be pumped and the dirt hoisted to the level of their old working tunnel. For this purpose they have been using an old-fashioned over-shot water-wheel, which is hardly adequate to the demands upon it. To meet the defects they have had made and are now putting in a new turbine wheel of a style and pattern made especially for their case. It is only 8½ inches in diameter, but with 17 inches of water under 45 ft pressure, it will make 900 revolutions a minute and will exert a seven-horse power.

WERRY'S OPERATIONS.—Capt. Wm. Werry, late superintendent of the Rising Sun G. M. Co., at Colfax, has returned to his old stamping ground west from Ophir, where he is opening a quartz ledge of his own, with most gratifying prospects. Some disagreement arising between him and the management, and having property of his own needing attention, he severed his connection with the Rising Sun mine, and is now occupied with the Belmont mine between Ophir and Lincoln. He informs us that the Belmont is probably sold to San Francisco capitalists; the ore tested by mill process yielding something over $35 per ton.

PLUMAS.

MILL.—Greenville *Bulletin*, Feb. 4: The superintendent of the Taylor-Plumas mine is urging the company to put up a 20-stamp mill immediately. Mr. Hammond and partner are running a tunnel on a ledge nearly parallel to the Ruby ledge at the Green Mountain. They estimate that about 60 ft farther will strike the principal, part they are aiming at.

TUNNEL.—Bachelder & Wing are running a tunnel to strike their ledge about 300 ft below where they have yet taken out any ore. They have a double shift of men working and make 8 feet every day. They estimate the length of the tunnel at 400 ft. They have ore enough out now to keep their mill running till April, and it averages the same as from the 1st beginning.

MUSICK.—Last fall W. E. Adams found a ledge in Round valley that opens out so well that he believes good pay can be made on it by working with a hand mortar and stamp. He has put up a cabin and will use a hand-stamp weighing about 150 pounds. This will be attached to a spring-pole and be expects to crush nearly a ton of rock a day. He believes the rock will yield from $40 to $50 a ton.

ALTONA.—Thomas Davis has men at work putting in a tunnel on the Altona claim. The tunnel is now in about 100 ft, and most of that distance is in ore. At first the vein was only about 18 inches wide, but kept getting wider, and at present is about 3 ft wide. The whole ledge matter prospects well, and good judges of ore are confident that it contains $20 a ton. This claim belongs to T. F. Emmons, J. P., and has been prospected at several points by tunnels run some years ago; quantities of the rock were worked and gave good results, but at the time this was done there was no mill in the neighborhood and further work was given up for the time. Now that milling facilities are near by, the mine will be fully opened and worked.

QUINCY.—The Consignee Mining Co. have struck pay from 10 to 50 cents to the pan.

SISKIYOU.

COLD WEATHER.—Yreka *Journal*, Feb. 4: Mining on McAdams creek has been suspended to some extent lately, like other sections, in consequence of the cold weather, which froze up the water supply of the drifting claims, although the Oak Grove is able to keep going as usual. The Yreka Creek M. Co.'s men are getting ready to start operations since the snow storm, but are troubled with snow in bringing the water down the upper ditch, so that it will take some time to get a supply into the reservoir. Operations will be commenced again at Hawkinsville in a day or two, with plenty of water to run day and night. Work in the Centennial mine, Klamath river, has been resumed again, and as soon as the ice pit thaws, the pump will be started to lift the water out. Should the weather remain cool, work can be continued for some time yet, but if we have a warm rain the river will no doubt be elevated so as to oblige the company to pull out. The Lime Gulch Co. still continue work, their ground being in a good locality to come under the warm influence of the sun every day, to prevent the water in pit and sluices from freezing, or the accumulation of ice on the wheels.

TRINITY.

NEW RIVER.—Cor. Trinity *Journal*, Jan. 21: We are having the most desirable weather for mining this winter. It is not as cold as it generally is at this season, and with an average of a storm a week the water keeps well up in the creeks. Very little money has been taken out so far, as everyone is running off top gravel, but all are satisfied with the prospects for the season. Boles & Co. are running this winter on Sailor's Bar and will set boxes in a month; they are using about 1,000 inches of water, or about half the capacity of their ditch. On Big Flat the Portuguese Co. are running two claims with good prospects in both. One mile below them is another Portuguese Co., on what is known as Jackass Flat. This is a large bar and a very light one to work, there being but few bowlders; their dump is high and the gravel pays from top to bottom, but they have only a small head of water, not lasting over four months in the year. Carson & Donald made a clean-up after two days' run, intending to bunt the best place on their bar to work this winter. They realized $27. Satisfied with this result they are now sluicing in that cut and will no doubt do well. S. Noble is still scraping and scratching on Slide creek and doing well upon what those who ran the claim last winter did not think worth the looking after. In quartz I have most gratifying results to report from one quarter. In a letter last spring I mentioned the discovery of a ledge on Eagle creek. Mr. Heley, the discoverer, has been quietly working on it at odd times ever since. He says but little about what prospect he has had from the ledge, but no doubt he has had a good one, judging by the way he is working at it. S. Noble has bonded his claim on Pantber creek to a San Francisco party for $3,000.

SAN BERNARDINO.

ARMAGOZA.—Inyo *Independent:* We are in receipt of a letter from Supt. E. L. Smith, formerly of the Los Angeles Co.'s works at Resting Springs. He is now managing the Armagoza mill, situate in the extreme northwestern part of San Bernardino county, owned by the South Pacific Mining Co., of New York. The nearest postoffice is Evanpah, located on the map way off to the southwest of the mines and mill. We believe some of the mines are located in this county, but the geography of the country, to pretty much the whole world, is about the same as the Greek language to a Hottentot.

TUOLUMNE.

PROSPECTORS.—Tuolumne *Independent*, Feb. 4: Mr. W. N. Harris, of Jamestown, is now dropping 50 stamps daily on the Little Gem and Alabama mines. Everything about the promises is in a prosperous condition. The ore that is being quarried out of the 12 ft ledge on the Alabama satisfies the proprietor each clean-up with far greater profits than would the same amount of money invested in any other enterprise.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.—*Enterprise*, Feb. 5: On the 2700 level the joint Union Con. east winze has been sunk and timbered 7 ft, and the main north lateral drift was advanced 18 ft.

ALTA.—Since last report the east drift on the 2150 level was extended 30 ft and timbered 40 ft; total length, 779 ft. The face of the east drift is in the casing of the ledge, through which some water is exuding, but we do not anticipate much water at this point. Rock hoisted, 544 cars; wood consumed, 74 cords; strokes made by pump, 62,200.

YELLOW JACKET.—The east crosscut on the 2328 level was extended 19 ft since last weekly report, making the whole length of the same 227 ft; ground, porphyry and quartz. Have resumed work in the east crosscut on the 3000 level at the foot of north winze, which is this day out 50 ft.

UTAH.—Connection of pumps completed to the 2500 level. Are now timbering and repairing the incline.

MEXICAN.—On the 2700 level the main north lateral drift has been extended 20 ft and the main south lateral drift 10 ft.

UNION CON.—On the 2700 level the main north lateral drift has been advanced 22 ft, the main south drift 30 ft; south drift No. 2, 15 ft, and east crosscut No. 1, 24 ft.

CON. VIRGINIA.—Are still cleaning out and repairing drifts and winzes. On the 1650 and 1750 levels are connecting with the old Con. Virginia shaft.

CALIFORNIA.—On the 1650 and 1750 levels are clearing out and repairing old drifts and winzes connecting with the old Con. Virginia shaft.

OPHIR.—During the week 134 tons of ore have been extracted from the croppings, and 153 tons and 510 lbs. sent to the mills. Assay not yet received from the mill.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, Feb. 4: Twelve ft have been added to the depth of the main shaft since the last report; total distance made to the 1st inst. being 37 ft. The levels above the adit look full as well as last week. Between the 8th and 9th levels the outlook is very encouraging for opening into ore of the same character as that found before in these levels. There are being extracted and sent to the mill about 63 tons of ore daily. Shipments for the week ending Feb. 2d, $17,057. Total shipments on January account, $66,470.91.

MOUNT DIABLO.—The sinking of winze No. 1 has been suspended for the present. The east drift from winze No. 3 is in 120 ft and is showing a 6-inch streak of ore in the face, from which a picked sample assayed $200. There is no change on the 2d level, though some good ore is being obtained from the east drift above the stopes on the 3d level. The Northern Belle mill started crushing ore from this mine on the 1st inst.

CHERRY CREEK DISTRICT.

NO MINERS WANTED.—White Pine *News*, Feb. 4: We regret to have to state that the inducements for newcomers here, just at present, are anything but flattering. Two mining companies have within the past month suspended operations, and it is not at all likely they will be resumed before spring opens. Several skilled miners have left here for other parts in the past two weeks, and there is a large surplus of idle men here just now. It is sheer folly for any one looking for employment to turn his steps towards Cherry creek. At no time within the past two years were the chances for obtaining employment so few as at present.

ESMERALDA DISTRICT.

THE UTAH MINE.—Esmeralda *Herald*, Feb. 4: Next week prospecting will be started in the Utah, and we confidently predict big things from this rich and famous mine. The Cortez and Utah companies are fortunate in having Judge Wells to develop and manage their properties. We inquire: Who said Aurora was dead? Not much. It has been resting, and will awaken into its new existence richer and more lawful than in its halcyon days of yore.

THE CORTEZ MINE.—Work in the above mine is going steadily ahead with most satisfactory results. Splendid developments are being made in the drift toward the Utah line. Work has been commenced on a winze running from the lower tunnel level, which will be pushed until water suspends operations. An extra force of miners will be put on in the course of a week or so and the work stopped by the late draft resumed.

FLORENCE DISTRICT.

SEDAN CO.—Belmont *Courier*, Jan. 25: The Sedan Co. have made a discovery in the Waldeck mine situated in Florence district, this county. Samples of ore taken from this mine received at this office average from $145 to $150 in silver to the ton. Mr. Charles B. Streitberger, one of the owners, writes that the company can furnish 25 tons of ore every 24 hours by working 8 or 10 men. Here is a good chance for some enterprising millman to try his luck.

LEWIS DISTRICT.

STARR-GROVE.—Lewis *Herald*, Feb. 1: The incline on the Starr-Grove ledge has been sunk at the rate of about 4 ft a day. The ledge in the winze still keeps its width and the ore is of good quality. The stope is now opened and ready for the extraction of ore.

EAGLE.—J. Penrose, contractor in the Eagle tunnel, has made good progress during the week, and is now in about 450 ft. The ledge is not nearly as broken, and has improved greatly in quality.

MORNING STAR.—The Morgan incline on the Morning Star mine is now 125 ft deep, in a good solid body of ore that assays well, both in gold and silver. There seems to be another ledge running parallel with the one that the incline is being sunk on and only a few feet distant.

SUN BEAM.—Latest reports from the Sun Beam mine are to the effect that the ledge has improved in the last week in quality, and still holds its own in size.

EMMA.—The contractors on the Emma mine are advancing the tunnel at a fair rate, and it should not be a great while before they strike the ledge.

HIGHLAND CHIEF.—The main incline on the Highland Chief is still being sunk by hand, the connections for the air drills not having arrived.

BETTY O'NEAL.—The stopes in the Betty O'Neal mine are looking away up, and Supt. D. P. Pierce feels jubilant. The body of ore struck a short time ago is proving a honanza, and the men are extracting at the least calculation half a ton per man per day. About 60 tons of ore is now piled up on the dump, which will mill $200 per ton. Stopes will be opened and the ore taken out as rapidly as possible.

SAFFORD DISTRICT.

ZANOLA.—Eureka *Sentinel*, Feb. 7: A correspondent writes us that an important development has been made during the past week in the Zanola mine at Safford. At a distance of 100 ft in the tunnel a body of rich ore has been struck. The character of it is the same as in the Onondaga. It shows strong, is 2 ft in thickness, and runs north and south. Gabriel intends passing through it to ascertain its exact thickness, when he will commence extracting it. The owners of this property are to be congratulated on their find, which fully demonstrates the existence of a ledge on the west side of the canyon. Negotiations are now pending for the sale of another valuable mine here, which will probably be completed in a few days. The purchasing parties thereof intend putting up hoisting works and will develop the property with great diligence.

SUMMIT SPRINGS DISTRICT.

SMELSER.—The *Silver State* recently published a well-written article on Summit Springs district, by an old miner, in which the Smelser mine was described. Mr. Smelser, one of the owners of the mine, informs the Lewis *Herald* that they are now 60 ft on the ledge, which a crosscut shows to be 26 ft wide at that depth. An average of the ore assays from $20 to $00 per ton in silver, and contains from 12 to 20% copper. The ore is not rich enough to ship, but could be concentrated, if reduction works were at the mine, so that it could be profitably shipped to smelting works.

WILLOW CREEK DISTRICT.

PROSPECTS.—Cor. *Silver State*, Feb. 2: A new strike has just been made on Rebel creek, which creates considerable excitement among prospectors. The ledge which has just been discovered is five ft wide, and the ore streak 2 ft thick. An average of this streak assays $230 in gold and $40 in silver to the ton. The Emma mine owned by A. H. Ruse, improves in appearance as depth is attained. The owner is now running a tunnel on the ledge, and is now in 100 ft under ground, and increasing the distance at the rate of 10 ft a week. This mine is situated about a mile and a half east of the Willow Creek Hotel. The Comstock mine, situated 6 miles east of Willow Creek, is owned by Cassidy, Siskron & Co. It was named Comstock because of the resemblance of the ore to that of the great lead of the same name. The ore assays from $80 to $800 to the ton, principally gold. The vein is opened by tunnel over 100 ft, and the owners are driving ahead at the rate of 8 ft a week. The width of the vein is not known, as they are following the footwall, along which there is nearly 2 ft of rich ore. They have not yet crosscut the ledge, which is considered by miners one of the best in the district outside the Ohio.

ARIZONA.

BONDED.—Arizona *Democrat*, Feb. 1: The Wade Hampton copper claim, in the Black Hills, has been bonded to Mr. Dewey, of Chicago. The bond is for 90 days, and the price $22,000. The Hampton is one of the best copper properties in the county. It adjoins the Eureka, sold some time ago by Messrs. Heed & Richards. The Hampton is now the property of Messrs. Ruffner & McDonald, who have developed the claim to a considerable extent. Two mines like the Eureka and Hampton, in the hands of men with means to erect reduction works, would be of great benefit to this town.

ASH CREEK.—John Stemmer came in from Ash creek last evening. He says the boys are digging away on the incipient bonanzas of that region, and that the claims are producing fine ore. John has staid with the works for years, and we feel certain will yet make it stick.

COLORADO.

SILVER KING.—Georgetown *Courier*, Feb. 1: The Silver King lode located in Spring gulch, and owned by the Hendrie & Bolthoff Co., of Denver, is developed through a tunnel and shows a 4-inch vein of solid galena and 8 inches of concentrating ore.

MACKEY.—The Mackey lode, owned by O. B. Weeks, M. Doyle and S. Rosenberg, is situated at the mouth of Spring gulch. It is worked through a shaft 140 ft deep, which shows about 2 ft of concentrating ore, and on the dump are nearly 100 tons of ore that would do to concentrate.

EUROPE.—The Europe lode, at the head of Washington gulch, is owned by Leithgwell & Co., who are working through a shaft 135 ft deep. The lode carries 6 inches of smelting ore that mills $198 per ton. They still do their hoisting with a whip.

MONSTER.—The Monster lode owned by D. G. Daigin & Co., is located in Washington gulch, and is also worked through a shaft, the depth of which is 150 ft. The shaft shows a fine ore vein and they contemplate sinking it to a depth of 250 or 300 ft.

WESTERN UNION.—The Western Union Co. is working seven men at present. The Morning Sun lode, owned by this company, continues to improve with depth. Last week they struck 5 inches of smelting ore that runs $180 per ton.

MENDOTA.—The Beck Bros. are still pushing work on their lease with remunerative success. They are working two shifts with 7 men. Three lots of ore were milled this week, but we have the returns from only one, which carried 57 ounces silver.

IDAHO.

ROCKY BAR.—Wood River *Miner*, Feb. 1: From a party just in from Rocky Bar, we learn that the residents of that snow-bound camp are jubilant over a streak of good luck in the way of recent rich strikes in the leading gold-producing mines. The Elmore is producing good ore and a few days ago made a rich strike in the western cut. The bonanza strike of the season, however, and one which makes the property second to none in this section, has just been made on the 300 level of the Bonaparte. Gold bearing quartz has been brought forth which upon assay yielded the highest results which a reasonable imagination could picture.

LAST CHANCE.—The Last Chance, a mine which is known far and wide for the beautiful specimens which it has produced, is no longer worked by individuals but is now under the management of Col. Matt Graham, who is running it on correct principles, and is working it as a mine.

NEW MILL.—The Johnson brothers, who are chief owners of the Mountain King, Vienna, Treasure Group and a large number of other mines near Vienna and Sawtooth, have been East during the winter, and have improved their time by placing Wood River properties and in contracting for mining machinery. They have formed a company which is to be operated somewhere near the headwaters of Wood river, that is known as the Union M. Co., of Lacrosse, Wis. The stock is divided into 360,000 shares and placed at $1 per share. It is not on the market, as the Johnson brothers took 50,000 shares at once, and the balance was immediately taken by a few moneyed individuals. This gives a working capital of $300,000, all paid in. A few weeks ago, F. A. Johnson, in behalf of the company, purchased of Fraser & Chalmers, of Chicago, a 20-stamp mill with main shaft and everything ready to attach 20 more stamps. A 150 horse-power Corliss engine of latest improved pattern will furnish the motive power. Everything about the mill will be first-class. It will be illuminated by the Brush electric light. The mill will be completed within 90 days from date of order.

MONTANA.

THE MAIDEN CAMP.—Helena *Independent*, Jan 28: Mr. A. M. Essler, who arrived yesterday from Maiden gulch, gives a flattering picture of the prospects of that new camp. Mr. Essler has charge of Hauser & Holter's mine, the Montana. He states that in the last three weeks, two men have taken out ore to the value of $5,000. The vein in the Montana is 12 ft thick and will average $400 per ton. There are numerous other rich leads discovered, ore from some of which runs as high as $10,000. New discoveries were being made constantly until the ground became covered with snow. The town of Maiden contains at present about 100 houses, with 3 stores and 10 saloons. The Maidenites expect a big boom in the spring, as the fame of the camp is not confined to the Territory, but has reached as far as the Black Hills, from which point it is believed there will be a stampede in the spring Maidenward.

BOZEMAN'S BONANZAS.—*News*, Jan. 28: Bozeman continues to congratulate itself over its prospects for becoming a mining center by reason of recent discoveries in Bridger canyon. There has been a rich silver ledge strike on Bridger creek, 4 or 5 miles from Bozeman. We are informed that the quartz is of a yellowish flint or slatish appearance, closely resembling that of the far-famed Stormont mine, at Silver Reef, Utah. The surface ore assays as high as $82 per ton. The ledge averages from 30 to 40 ft in width, and is well-defined, with a granite and slate formation. J. J. Bennet and other parties are talking of shipping a few tons to Butte to have it thoroughly tested. If the smelter test confirms the result of the assays, this country will have no insignificant future.

UTAH.

MEMORANDA.—Southern Utah *Times*, Feb. 2: The Mamouth No. 2 is situated in Bitter Lake district, about 15 miles north of Frisco, and is the property of Jno. P. Lamotte, and Lindsay & Feeney. The owners are developing the property in a most satisfactory manner. At a depth of 20 ft a 4-ft vein of good grade iron ore, with traces of silver and lead has been uncovered. The True Fissure mine, located on the west side of Grampian mountain, at about the same elevation as the Ern Silver mine, gives evidence of a veritable bonanza. It is owned and is now being developed by J. H. Hedges and the Haskill Bros. The ore croppings on the surface are over 50 ft wide, and steps are now being taken to see what there is below. James Tathum, of Philadelphia, and Charles Tathum, of New York, spent Sunday in camp. They are the owners of the Shauntie smelter and some valuable mines in Star district. During their visit they spent several days in Star district looking over the ground with a view to starting the Shauntle smelter at an early day, provided they can make arrangements for a necessary supply of ore.

Four Rare Trees of Arizona.—No. 2.

[Read before the California Academy of Sciences, by J. G. Lemmon, Oakland, Nov. 21, 1881.]

No. 3.—"Spreading Cone Pine."

Pinus Reflexa, Engel.—The other new Arizona pine has been known for a longer time than *Arizonica*, but so imperfectly, owing to meager specimens and notes of habit, that Dr. Engelmann upon the reception of abundant material, has only this season declared it to be distinct. Whether this conclusion proves correct or not, the tree is one of great rarity and beauty, hence its description cannot fail to interest the Academy and the general reader.

[A communication from Dr. Engelmann, bearing date of Jan. 4, 1882, announces that extensive examination of specimens and notes confirms the position taken that this pins is a distinct new species.—J. G. L.]

History.

This pine has all along been catalogued as a variety of *P. flexilis*, a peculiar species inhabiting the highest and coolest slopes of the mountains of the State of Nevada. This southern tree was particularly characterized by the position taken by the cone-scales; they are always squarrose or reflexed. The characters otherwise agreeing mainly with *P. flexilis*, this was called varity *reflexa*.

As stated, our pine authority has lately raised this southern form to the rank of a species retaining the same name—*reflexa*.

We first met with this tree in the spring of 1881, on the top of Mt. Graham, at an altitude of over 10,000 ft.; also on the highest peaks of the Patagonia mountains. In May of the past season, we found noble specimens of it in the deer park of the Catalina mountains, and in September fine trees were seen on the highest peaks of the Chiricahua range. No doubt nearly all of the high peaks of the southeastern part of the Territory are ornamented by this pine.

Its Near Relatives.

The *Pinus reflexa* closely resembles our magnificent sugar pine *P. Lambertiana*, and, still more closely as to size, the high mountain pine *P. monticola*. It has the same majestic uprise of the trunk, the same reddish-brown, finely-checked bark, the same want of, or shortness of the lower limbs, the same large, long, outreaching upper limbs that give a broad head to the tree; and, lastly, to complete the deception, it hangs its large, long cones, like Chinese lanterns, out from the ends of these arm-like upper limbs. This tree is, in fact, very closely related to the above-mentioned species, so closely that locality, perhaps, is responsible for the slight differences to be soon set forth.

Pines Classified.

Dr. Engelmann, following Endlicher, divides the pine family into two groups or sections, based upon characters of the scales, number of leaves in a fascicle and the condition of their sheaths, as being loose and deciduous, or they are presistent; also upon the characters of the wood, as soft or hard, light or heavy, etc.

One section, *Strobus*, includes those pines whose cone-scales are thin and soft, their exposed portions, called *apophyses*, bearing a marginal boss or umbo at the apex, which is unarmed, *i. e.*, has no prickle. The leaves are always in fives, their sheaths loose and deciduous; the wood soft, white, light, and containing but little resin.

This section embraces our *Lambertiana*, *monticola*, *flexilis*, and the new *reflexa*, described; together with ten Eastern and old world species.

The other section, *Pinaster*, includes those pines whose cone-scales are generally harder, the apophyses, with a dorsal umbo, which is usually armed with a prickle, leaves, 1 to 5 in a fascicle, their sheaths usually persistent; wood, generally harder, heavier, and more resinous.

This larger section embraces our *monophylla*, *edulis*, *Parryana*, *Balfouriana*, *Tarreyana*, the new *Arizonica*, described, *ponderosa*, *Chihuahuana*, *contorta*, *Sabiniana*, *Coulteri*, *insignis*, *tuberculata*, and *muricata*, with thirty-five Eastern and old world species.

Salient Characters.

The *Pinus reflexa* differs from its congeners in the following minor characters, in addition to the salient features given. *Lambertiana* and *monticola* have long-winged seeds, leaves sharply serrate and denticulate at tip, while the new *reflexa* has large wingless seeds; leaves mostly entire and not denticulate; but the most characteristic of the salient features just announced (Jan. 4, 1882) by Dr. Engelmann: "Long-peduncled, cylindric female aments, erect in the first, recurved in the second year, which associate it with the true *Strobi*, while the large winglees seeds distinguish it from the other species of that section."

Added to this is the character first detected, which gives a name to the species, viz., the scales are elongated and the apophyses strongly reflexed. It is these points, principally, that canee this tree to be separated from its nearest ally, the *flexilis*, of Nevada, and give us a new and beautiful tree, well worthy of extensive cultivation—*Pinus reflexa*.

No. 4.—"New Arizona Cypress."

Cupressns Arizonica, Greene.—Lastly we come to the description of a new and charming cypress, of Arizona.

The genus *Cupressus* contains but a few species, all of which are peculiarly distributed. Four or five are found in Central Asia and the Mediterranean region; 3 or 4 inhabit Mexico; two, or perhaps only one species, on the California coast; one on the slopes of Mt. Shasta; one on the island of Guadalupe, off the coast of the peninsula of California, and now one in Arizona.

Most persons on this coast are familiar with the Monterey cypress, and it may be taken as the type of the genus. The trees are peculiar for the light, finely divided branches that give to the foliage that airy, lovely appearance that has caused the cypress to be so generally liked for ornamenting lawns, streets and cemeteries. Also, like the true cedars of the old world, all the species of cypress are very pliable to influence, and hence are trained to form trees of fanciful shape, bowers, screens, hedges, and the like.

One fact is very interesting in this connection, that the flat-topped appearance, or that flattening of the head of each limb into benches, so generally observed of the tree in its original home on Monterey point, is due entirely to the depressing influence of the ocean winds. In the sheltered interior the same tree, if isolated and untouched by the hand of man, assumes a symmetrical cone or spindle form.

The Family of Cypress.

The Monterey cypress was named by Hartweg *Cupressus macrocarpa*, on account of its very large fruit, often over an inch in diameter. In its limited home on Monterey point, the tree has a flattened top, with spreading branches, with dark gray and somewhat rugose or ridged bark. The scale-like, appressed, imbricated, bright green leaves are obscurely pitted on the back, with often a longitudinal furrow on each side. Another cypress from the coast farther northward, including Marin county, is described under the name of *C. Goveniana*, Gor.; but Prof. Watson has lately declared the characters insufficient for separating this from the *macrocarpa*. It is smaller; branches spreading and somewhat pendulous; branchlets, slender; leaves, mostly without the dorsal gland and furrows; cones smaller, with smaller seeds.

The Shasta cypress also found near Clear lake, is *C. McNabiana*, Murr. It is a small tree with numerous short, slender branchlets; leaves small, deep green, somewhat glaucous, with conspicuous pits or glands upon the back; cones very small, with thin, prominent bosses, the upper usually very prominent and incurved; seeds small and very numerous.

A fourth species of cypress is named from the island where found, *C. Guadaloupensis*, Wat. It is a large tree, the bark flaking off in thin plates, leaving a smooth, claret-red surface; branches drooping and very slender; foliage glaucous-green; glands on the leaves, obscure; cones, large, an inch or more in diameter, strongly hossed; with very large seeds, three or more lines long. Already in cultivation in San Francisco, although known only since 1875, and promising to become a desirable lawn tree.

History of the New Cypress.

The last discovery, *Cupressus Arizonica*, was first heard of last year through mesger specimens collected by Mr. Treadwell and sent to Prof. Hilgard of the California University. Here Dr. Engelmann saw them, and from the information that the branches were naked and smooth like manzanita, the Dr. judged them to indicate a new species, and named it *lævicaulis*.

During the summer Mr. Greene discovered it on the high peaks of the San Francisco mountains. He studied it cursorily and published a meager description in the *Botanical Gazette*, under the name of *C. Arizonica*, Greene. In May last, the writer found a dwarfed tree in the Santa Catalina mountains, but could not get good specimens from it. About the same time Mr. Pringle found specimens in the Santa Catalina also, and forwarded them to Dr. Engelmann.

In August last we returned again to Arizona, this time to explore the Chirricahua mountains in the farther corner of the Territory. After varied experiences, hindrances by the outbreak of the Apaches, sickness by overwork and exposure, we found ourselves in September domiciled in the mining tunnel of a hermit of Rucker valley in the south end of the range, and under the slopes of the highest peaks. Soon we were making regular explorations by long trips every third day to some distant mountain and its canyons, the intervening days being necessarily spent in recuperating strength and drying out our collections. Great was our joy when on one of these arduous climbs up a lofty peak, to find on the summit a ridge of over a mile long, thinly clothed with a beautiful cypress. As none had ever been reported from this region, and as we were many miles from the before-mentioned cypress localities, we hoped for an original discovery, and with much labor obtained full specimens of foliage, limbs, fruit, sections of wood, bark, etc., which were forwarded to Dr. Engelmann. He returned the information that the tree was his *C. lævicaulis*, but as Mr. Greene had done the most at bringing out its characters, he must be allowed the honor of naming it.

Its Beauty and Adaptability.

The *Arizonica* is, without doubt, not only the prettiest, but the most pliable of the whole family. We not only found it on this high ridge at an elevation of over 10,000 ft., but also along the streams on both sides at the base of the long mountain on the general level of Rucker valley, at an elevation of about 5,000 ft. Young and old trees were found in both localities apparently alike in robust appearance as if equally at home on lofty peak or in lowly vale.

The young trees are gems of beauty. The twigs are regularly alternate and form, not flat sprays, like the Lawson cypress, but quadrangular pyramids of foliage. The little twiglets are quadrangular by the four even, longitudinal rows of imbricated leaf-scales. These scales under the magnifier are found to have a deep pit on the dorsum, like the Shasta cypress. The trees often attain a hight of 60 to 80 ft., with a diameter of 4 to 6 ft. The upper limbs of large trees hend gently outward, giving a flattened top to the tree. All the limbs shed off their outer bark leaving the inner smooth, reddish-colored, and clouded with lighter spots from which the bark has recently fallen. The trunk of all the trees, old and young, retains its bark, which is grayish, of medium thickness, and disposed in longitudinal ridges, frequently dividing into reticulations that cut the furrows between into diamonds and rectangles. The cones are large—three-fourths of an inch in diameter—the younger ones bearing a boss near the center of each apophysis which is often elongated and incurved like a spur. The seeds are usually triangular from overlapping, and are of medium size. Singularly enough, but few fertile seeds have been detected in the cones we obtained with such care, so it is problematical whether or not the new cypress will soon be in cultivation.

It is but proper to state that Dr. Engelmann writes that he is by no means certain that this Arizona cypress that is so widely diffused, and which has so long remained uncollected, is not identical with some of the Mexican species—a doubt that requires much future exploration and investigation to clear up. But whatever the result, we have the tree over on our side of the line, and it must in future belong to the United States flora, and be frequently described, catalogued and discussed by American botanists. Fortunately, it is very symmetrical, beautiful and tractable; so it becomes a very valuable acquisition to the wonderful products of our coast, and soon—who knows how soon?—we may sit in our own bowers here in the cities of the Great Bay, and yet be shaded by the *Pinus Arizonica* on one side, and the *Cupressus Arizonica* on the other, while we are admiring the growing beauty of rows of *Pinus reflexa* and *Platanus Wrightii* along the street.

[To prevent ambiguity and mistakes, let me add that the popular lawn tree—the "Lawson cypress"—so called, is not a cypress at all, and for that reason has not been described in this article. This tree is at once distinguished by its graceful, flattened or convex sprays of foliage disposed in horizontal plumes or banners.

It is most unfortunate for us who attempt to popularize botanical names, that this lovely tree should be called *Chamæcyparis Lawsoniana*. When we find that to another of our most interesting trees, the "Douglass spruce," the masters have given the unpronounceable name of *Pseudo-tsuga Douglasii*, teachers become discouraged, and the writer heartily joins them in a demand for a shorter, better, more euphonious nomenclature for our trees.—J. G. L., Oakland, Jan. 20. 1882.]

(Concluded.)

Cheap Smelters.

A Chance for a Poor Man.

There are many ledges in this district, notably around Mineral Hill, which carry from 40% to 80% lead, and more or less iron with the spar, thus forming a natural flux for smelting. Such ore has been selected and used to flux ores in other districts.

These may be readily and cheaply smelted in a Mexican furnace, which is made of common clay adobes, or sun-dried bricks. A furnace of this description can be constructed with 350 adobes. It has a small, square chimney, 10 ft. high, and from eight to 10 inches wide on the inside, with a hole, resembling an auger hole, perforating the bottom. This hole is slanting, so that a bellows may be placed on one side of the chimney, and the smelted ore run out on the other side. The furnace is fed through a small hole, about five ft. from the ground. About a quart of ore and two quarts of charcoal are thrown in, alternately, until the chimney is full. Fire is then applied, the bellows set in motion, and the furnace is soon in full blast, acting like a blow-pipe on a large scale. An iron bar, to skim the slag from the metal, is all that is further necessary. The metal can be run out on the ground or into clay molds, when the ore contains much sulphur, which will be indicated by its coarse, bright appearance. The ore must first be slagged. This is done with wood fuel, in a slanting chimney, about 10x15 ft. long, built of adobes. A cord of wood will slag several tons of ore. The chimneys, though small, are surrounded with clay in order to retain the heat.

This process of smelting is very common amongst the Mexicans, and anyone who has seen a *fundacion*, as they are called, can build one, for they are all alike. They have a capacity of about five tons a day, and can be run at a daily cost of $30, for charcoal, wood and labor. We have experimented with one of these furnaces at Willow Springs, four miles from Mineral Hill, where it can be seen by anyone. The pigs of lead run out by us have assayed $130 per ton in silver. The entire cost was about $300, including construction and experiments, which were very successful. Lead is worth at present over five cents per lb, at which price it pays well to ship.—*Pinal Drill.*

Three nuggets, weighing 18, 20 and 58 ozs., were recently found in the Bald Mountain mine dump, Sierra county.

A New Process for Ores.

Says the Denver, Colorado, *Tribune:* The Waitz Mining Co., with their principal office at Silver Cliff, claim to save 90 per cent. of the value of the ores treated. The closed furnace is built upon an incline and arranged in terraces; the ore, previously crushed to about the size of peas (as ore of this size is more readily heated than pulverized ore), is removed from shelf to shelf by automatic scrapers. During the process of heating, said to be accomplished in from forty to eighty minutes, the base metals, are completely desulphurized and oxidized. The latter takes place by means of the conditions under which the ores are treated, viz., in the absence of atmospheric air in the presence of oxygen and in the absence of nitrogen, the oxygen either evolved from the ores themselves, as in the Bowlder and Buffalo Hunter (containing oxides of manganese and iron), or by the addition of some oxygenated substance, should such be lacking. The conditions under which the oxidization of the base metals takes place are not such as to oxidize the noble metals. After leaving the furnace the ore is pulverized preparatory to introduction to the amalgamator. Pulverization is now accomplished with less power and in less time than before heating, in consequence of the disintegration of the ore by that process. Any amalgamator may be used, though Prof. Waitz holds the patent to one consisting of two upright cylinders parallel to each other, and resting on a bed-plate. These cylinders are connected by pipes at top and bottom, the pipes of sufficient size to permit of the passing of the pulp from one cylinder to the other. Within each cylinder are Archimedian screws revolving in opposite directions at a high rate of speed; the quicksilver is placed in the bottom, reaching above the bottom opening; the pulp is placed in each on top of the mercury, so that as the screws begin to work they force the pulp up in one and down in the other, and assisted by the vacuum, produce a sort of rotary motion continually changing the pulp from one cylinder to the other and through the body of quicksilver at the bottom, until discharged into the settler, from this point to be treated in the ordinary manner.

The Waitz process is said to be particularly applicable to the treatment of the sands of placer claims, and will prove an absolutely invaluable auxiliary where water is unattainable. No crushing is needed, the sands being simply put through the furnace and amalgamated and retorted. In reference to the subject, a gentleman from Salida states as follows: "My attention was called to the Waitz process last spring. I saw no immediate results in the tangible reduction of ores; but, as the Professor invested only his own money, sold no stock, nor desired so to do, I became somewhat interested, and visited the little mill at Rosita. I found it incomplete and inconvenient, but upon investigation could not but recognize its simplicity."

Improvements of the Mokelumne River.—Col. G. Mendell, of the corps of engineers, who was sent to examine the Mokelumne river from Woodbridge to its mouth, has just returned the following report to the Secretary of War, which has been transmitted to Congress. That report sets forth that the channel may be put in permanent good condition by an expenditure of $8,250, which would suffice to remove all snags, about 150 in number, clear the banks of overhanging trees, and deepen the shoals near the mouth of the Cosumnes river. It appears from statistics embodied in the report, that about 20,000 tons of wheat, barley, potatoes and other produce are now shipped annually from the Mokelumne river, and it is confidently estimated that 73,000 tons of freight would be shipped by the districts bordering on this river, if the condition of its channel were improved as recommended. Among other things, it is stated that shipments of wood and brick from the south side of the Mokelumne river amount now to 4,600 tons yearly, but with improved navigation will run up to 30,000 tons, as the material for brick-making is the best in the State, and all that is required to develop the business is a clear river.

The Black Knife Mine.—Col. J. B. Nutton, superintendent of the Black Range M. & M. Co., arrived in town Monday evening, on his way to Carrolton, Ill., to consult his company pertaining to their mining intsrests, situated in the Cuchillo Negro mountains, near Fairview. The Colonel brought with him a variety of ore from the Black Knife mine, which is pronounced by men of experience to be the best assortment of argentiferous ores they have seen from that section of the country. From the best information we can obtain, the Cuchillo Negro range will yet prove to be one of the best mining campa in the Territory, and strong hopes are entertained that the Carrolton Co. will at once erect reduction works, as the large amount of ore on their dumps will fully justify them in putting up first-class works. There is no question but what the Black Knife will furnish enough ore within the next six months to supply a two-furnace plant, and that of a high grade.—*Socorro Miner.*

A nugget worth $980 was recently found in the Osceola diggings, White Pine county, Nevada, by some Chinamen. Several years ago a nugget weighing $4,000 was found in this district.

Tanite Emery Wheels.

This solid emery wheel, once offered to the public as a novelty, is now acknowledged as a standard manufacture. In tanite alone is found a base for emery which is at once chemically inert, devoid of poisonous qualities, free from offensive smell, tenacious, without being stony, cohesive, yet not gummiug or capable of being softened by heat, and friable without being brittle. Tanite is also a base which admits of such countless and varied modifications in the general qualities of wheels as enables them to be suited exactly to the most varied and special uses, yet without sacrifice of these general good qualities. The experience of 13 years by the Tanite Co. has brought their manufacture to a systematic basis, and every precaution is taken to secure uniform good quality. The tanite emery wheel is a rotary file which runs a mile a minute, and whose cutting points never grow dull. What the circular saw is to the hand-saw, the tanite wheel is to the file. He who equips his workshope with suitably-mounted emery grinding machines, yokes steam engines to his files instead of men.

We have just received the Tanite company's illustrated catalogue for 1882, and from it extract the following paragraph which explains itself: "The Tanite company was organized in 1868, and though not absolutely the oldest, is among the few old manufacturers in this specialty. During its 14 years' experience it has issued many circulars and catalogues, and for several years published a paper devoted to its own special industry. In 1873 it issued a 124-page catalogue. Now, with increased business and greater variety of goods, it issues an 80-page catalogue. The decreased catalogue is due to the simplification of the business, which has been reduced to a system. Makers and users know what is wanted better than they did 14 years ago. Emery wheels are of better average quality all over America, and being run on machines built for the purpose, are used with greater safety than ever. It used to cost us about $5 to sell a $4 Emery wheel; as the buyer needed a ream of correspondence, many reams of printed matter, and then a visit from a first-class engineer; after which he generally returned the wheel, damaged and used up, with express charges both ways added, and a letter saying the wheel was worthless. Now he writes that he couldn't do without $4 wheels, even if they cost $20 each. The Tanite emery wheel is not low in price, but it is high in reputation. Those who want diamonds, pianos and emery wheels go to Tiffany, Steinway and the Tanite Co. Emery wheels are not valued by their looks, nor diamonds by their weight only. The firms which last are those whose goods have lasting qualities. If you want standard goods, you can get them of standard concerns, and they are generally worth both their price and their repute, even though you and your workmen are too careless to discover it. This company offers its goods at fair prices to fair buyers and careful users. It doesn't have even a single drummer to entice or drive unready customers into unwilling bargains speedily repented of. It carries a stock of goods in almost every large city in the United States (Nos. 2 and 4 California St. in San Francisco), and several in the Old World, and aims to have them considered standard goods by all the dealers in the land."

Cheap Shaft-Sinking for Prospecting Purposes.

In the Pennsylvania hematite regions, the common method of prospecting is by means of small test-pits, sunk through the overlying clays and gravels to depths of from 10 to 50 ft., or more. The Pennsylvania Dutchmen who sink these pits, often become quite expert at the business, and will take contracts at remarkably low rates to sink any depth required, or until bed-rock is reached. In the Lehigh valley, according to Prof. Cook, the contract price for digging such pits up to 50 ft. in depth, ranges from 15 to 25 cents per ft. The peculiarity of the method followed by these prospectors is in the very small diameter of the shaft sunk, ranging from 30 inches to 3 ft. only. A light pick and a spade, with handles about a foot long, are used for the work, and the dirt is hoisted in a small bucket, holding about 50 lbs., by means of a light windlass, which can easily be carried from place to place. Two good men can by this method sink 20 to 30 ft. in a day, and the peculiar skill with which they adapt themselves to their narrow quarters is most remarkable. Up to a depth of eight ft. or more, these human gophers sink without using the windlass, and contrive to throw the dirt clean out of the hole without so much as a pebble falling back on them. These pits, on account of their small diameter, and the care and skill with which they are sunk, apparently need no lining or timber support to insure the safety of the men, whereas larger shafts, sunk in the ordinary way, would have to be timbered, and would cost five to ten times as much. A description of, and notes on, this method of prospecting will be found in the annual reports of the State Geologists of New Jersey for 1872 and subsequent years. Our attention was called to the method by Mr. Wm. Allen Smith, '68, who has had occasion lately to employ two of these Pennsylvania shaft-sinkers in the examination of several hematite properties in this State.—*School of Mines Quarterly.*

Useful Information.

Posts for Barbed-Wire Fences.

A Western exchange says: To render barbed wire a complete success it will soon be necessary to find some substitute for the common wooden post. The kinds of wood that are suitable for fence-posts are somewhat rare, and are becoming scarcer every year. Cedar is the favorite wood, but the demand for it for other purposes is rapidly increasing, while nothing is being done to increase the supply. Cedar trees are of very slow growth, and it appears to be impracticable to raise them for industrial purposes. Cedar is now in active demand for paving blocks, telegraph poles, ornamental ware, and various other purposes. The attempt has been repeatedly made to use living trees for supports for wire employed in the construction of fence, but in the majority of instances it has been unsuccessful. The trees are not in the line where the fence is required, and it is the work of many years to produce them. The wire soon becomes imbedded in the wood and rusts. Posts made of clay burned like bricks, and of concrete, have been used to some extent, and have been quite successful. They are, however, heavy to transport, liable to be broken, hard to set in the ground, and easy to be lifted by frost. Stone posts are open to all these objections, but they may be used to advantage in many places where stone easy to split is found in the vicinity. Stone posts have been used for a century in some of the Eastern States. A hole is made to hold a nail or staple, and is closed by the use of lead or sulphur. The most promising material for posts for supporting barbed wire appears to be wrought iron. It is strong, cheap to handle, and easily shaped into any form desired. By cutting slots in one side the wires may be fastened in them and the use of staples obviated.

Electrical Sheep Shears.

Mr. Edison has received a communication from New Zealand, in which the writer sets forth at length the pressing need of some means of shearing sheep evenly, rapidly, and without risk of hurting the animal. Sheep raising, it will be remembered, is most largely carried on in sparsely inhabited districts, where skillful shearers are hard to get.

The writer appeals to Mr. Edison, thinking that an electrical apparatus might be made to answer, the cutting to be done by means of a wire highly heated by an electric current. The length of the heated wire or cutter would have to be about three inches.

The use of an incandescent wire of platinum for cutting has been entirely successful in surgery, in removing tumors and other diseased or morbid growths, and there is a possibility that it might answer for cutting wool. Whether the heated wire would injure the wool, or whether the accumulation of ash would speedily make the cutter inoperative, are questions which trial alone can decide.

Some years ago patents were taken out for a method of felling timber by the use of wire electrically heated, but when the method was put to practical test it failed, as the ash of the burnt wood soon surrounded the wire with a fire-proof shield.

Whether a similar difficulty would arise from the coating of the wire with wool ash and charred wool on applying the method to wool cutting, and whether this or other possible difficulties can be easily overcome in an electrical shearer, can be determined only by trial.

A Street Car which Carries Its Track. The Accommodation Car Co. has begun operations here with a capital stock of $1,000,000, divided between the patentee, T. T. Prosser, and F. F. Cole, a real estate man. The object of the company is to build and equip a thousand cars and put them upon the streets of Chicago. The car is the patent of Mr. Prosser, and as regards present appearances is a queer, ogle-some-looking craft, which carries its track along with it, and to all intents and purposes is designed to traverse any and all lines of streets. The car, which is of the ordinary kind, is mounted in the middle upon a truck which sits on four wheels, each about one foot in diameter, and which rest upon the ground, and are only held to the car by a set of wheel clamps. The car is designed to hold 50 people, and the owners claim that the more it carries the easier it runs. It will be stopped in the usual manner, and two horses will be required to pull it. The owners say they intend putting the cars upon the principal streets of the city and placing the cash fare at four cents and selling 30 tickets for $1.—*Chicago Times.*

To transfer a photograpic print to glass for painting or for other purposes, separate the paper print from the background by steaming it; dry thoroughly, and having given the warmed glass an even coating of clean balsam or negative varnish, place the face of the print on the surface thus prepared, smooth it out, and let stand in a cool place until the varnish has hardened. Then apply water, and with a soft piece of gum-rubber rub off the paper so as to leave the photographic image on the varnished glass.

Electric lighting is in successful operation on more than 60 steamers of the Mississippi river and its tributaries, and is believed to add much to the safety of traffic and travel.

The fusibility of soft solders is increased by adding bismuth to the composition. An alloy of lead 4 parts, tin 4 parts and bismuth 1 part, is easily melted; but this alloy may itself be soldered with an alloy of lead 2 parts, bismuth 2 parts and tin 1 part. By adding mercury, a still more fusible solder can be made. Equal parts of lead, bismuth and mercury, with 2 parts of tin, will make a composition that melts at 122° F.; or an alloy of tin 5 parts, lead 3 parts and bismuth 3 parts, will melt in boiling water. In mixing these solders, melt the least fusible metal first in an iron ladle; then add the others in accordance with their infusibility. To cast strips of solder, pour the molten metal on a flat surface of stone or metal, drawing the ladle along the while, to leave a thread of metal of the desired substance.

Improved Tin Cans for Preserved Foods. It is stated that a very simple and neat improvement has been effected in the preparation of the tin cans now so extensively used for preserved foods. The body of the can has a bayeled rim, upon the slope of which the cover is soldered. When the cover is smartly tapped round the edge, it is expanded, and the solder joint broken by the wedge action of the bevel. The can is thus opened without injury to the lid, while the present inconvenient and even dangerous process for cutting open these air-tight cases is entirely avoided. The improvement involves no additional cost, and the soldering is applied externally.

A Fire-extinguishing Powder.—A London inventor claims to have devised a fire-extinguishing preparation which can be kept in powder or in solution, and asserts that it is not only more speedy and effectual in action than water, but that nothing, once sprinkled with it, will ignite.

Good Health.

Malarial Organisms in the Blood.

In the blood of patients suffering from malarial poisoning, M. A. Laveran has found parasitic organisms, very definite in form and most remarkable in character. Some were cylindrical curved bodies, poised at the extremities, with a delicate outline and a transparent body, colorless except for a blackish spot in the middle, due to pigment granules; on the concave side a fine line could often be traced, which seemed to unite the extremities of the crescent. These bodies presented no movement. Spherical organisms were also seen, transparent, of about the diameter of a red blood corpuscle, containing pigment grains which, in a state of rest, were often arranged in a definite circle, but sometimes presented rapid movements, and then lost their regular arrangement. On the borders of the spherules very fine filaments could often be perceived in rapid movement. These filaments were in length three or four times the diameter of a red corpuscle. Their number varied. Sometimes three or four were seen around a spherule, to which they communicated an oscillatory movement, displacing the adjacent red corpuscles.

There were also bodies of spherical or irregular form, transparent or finely granular, about the hundredth of a micro-millimeter in diameter, containing dark red, rounded pigment grains, either regularly arranged at the periphery or aggregated at some part of the spherule. The bodies and granules were both motionless. These appear to be the ultimate or "cadaveric" stage of those last described. They have no nuclei, and do not tint with carmine. Lastly, spherical elements were met with similar to those already described, but much smaller in size, and apparently representing a stage in their development. The animated nature of the mobile pigmented spherule, furnished with filaments, appears indisputable. Besides these organisms, the blood of patients suffering from malarial fever contains: 1. Red corpuscles, which appear to be vacuolated at one or two spots and contain pigment granules. 2. Pigmented leucocytes. 3. Free pigment granules, possibly proceeding from the destruction of the parasitical organisms.

These elements were first discovered by M. Laveran about a year ago, and since then he has examined the blood in 192 patients affected with various symptoms of malarial poisoning, intermittent and continued fever, and palustral cachexia, and found the organisms in 180. The disease had been contracted for the most part in different regions of Algeria and Tunis. He convinced himself, by numerous and repeated observations, that these organisms are not to be found in the blood of persons suffering from diseases that are not of malarial origin. In most of the cases of malaria in which the examination yielded a negative result, the patient had undergone a course of treatment with quinine, and to this fact the absence of the organisms from the blood was probably due. The addition of a minute quantity of a dilute solution of sulphate of quinine to a drop of blood was found at once to destroy the organisms. In all the examinations great care was taken to preclude the entrance of any extraneous objects into the drop of blood examined.

In general the parasitic bodies were found in the blood only at certain times; a little before, and at the moment of, the accession of the fever. In some very obstinate cases the organisms were always present in the blood. They rapidly disappeared under the influence of a quinine treatment. It is conjectured that in the apyrexial intervals the organisms probably sojourn in internal organs, especially the spleen and the liver. After death from malarial disease pigment granules are found in great numbers in the blood, and especially in the small vessels of the spleen and liver; and they may be, in the most severe cases, so abundant that not only the spleen and liver, but the marrow of bone, and even the gray substance of the brain, are darkened by their presence. These pigment granules, which may obstruct the capillary vessels, appear to be derived from the parasitic elements, which perish after death, and become then unrecognizable.—*Lancet.*

Precautions Against Small-Pox.

It would be useless to deny that this disease has become epidemic in many parts of the United States, and is gradually spreading. Thus far Illinois has been the greatest sufferer by the disease. It is said that it has made its appearance in most of the counties of the State. Perhaps our physicians will find a hint in the following article, which we copy from the Philadelphia *Record:*

Many deaths from small-pox may be prevented by knowing how to treat the disease. A gentleman in this city found that a child of his, one with two good vaccination marks, had small-pox. The child was immediately placed in an upper room, which had been stripped of everything but the bed and bedstead, a chair and small table. The father took charge of the child, attended to everything; no one else was allowed to come on that floor; food was left in the second story hall, which the attendant, after washing his hands in carbolic soap, transferred to other dishes, which were washed and disinfected in the sick room. Nothing touched by the patient was allowed to go down stairs; all the slop was thoroughly disinfected with chloride of lime, carbolic acid and sulphate of iron; soiled clothing was covered with chloride of lime and immediately burned in the furnace. When the patient was well the bedding was sent to the small-pox hospital, the room thoroughly scrubbed, and the walls and floor wiped over with a solution of carbolic acid in water, just so weak as not to change the color of the wall paper. Then a good strong earthen vessel was placed in the room and about half a pound of chloride of lime put into it. On this was poured a half a pound of muriatic acid, and the door immediately closed. The chlorine gas thus generated permeated every crevice in the room. This was done three times a day for several days, the adjoining rooms being also filled with the gas. The result was, that with a large family, small-pox all around and many fatal cases in the neighborhood, no other member of the family had it, and that room is just as free from small-pox taint as if the disease had never been there.

A New Dental Disease.—A child, aged 10, whose teeth six months ago appeared to be all perfectly sound, came to me with toothache in the right lower canine. I found that a large portion of the enamel had disappeared from the front surface of the tooth, as if it had been chipped violently off; the dentine was all exposed, but there was no softening or appearance of decay. The disease, which has commenced in several of the other incisor teeth, appears first as a small white spot in about the thickest part of the front surface of the enamel, which it seems to penetrate; and then, suddenly disintegrating, this comes away, and exposes the remaining enamel and the dentine. This disease is altogether a different thing from the gradual decay, or wear at the neck of the teeth, frequently met with in adults, for in this case the patient is only 10; and, as far as I have been able to ascertain, the incisors and canines never have been known to decay in the manner above described. We are often at our wit's end to cope with the increasing prevalence of caries in the teeth of the very young; and if this be (as I fear it is) a new form of destructive energy, the sooner it is recognized the better.—*N. Stevenson, British Medical Journal.*

Substitute for Cod-Liver Oil.—It is claimed by a writer in *Nature* that the oil of the "oolachen" or "ulikon," the candle-fish of Alaska, possesses all the medicinal qualities of cod-liver oil. This fish has long been an ichthyological curiosity, and has been noticed by almost every traveler who has visited the coasts of British Columbia and Southern Alaska. It is a small silvery fish, averaging about 14 inches long, and in general appearance much resembling a smelt. It is the fattest of all known fish, and affords a very superior oil when tried out. Dried, the fish serve as torches. When a light is needed, the tail is touched to the fire, and they will burn with a bright light for some time. No description can give an adequate idea of their numbers when ascending the rivers from the sea. The water is literally alive with them and appears to be boiling. These fisheries appear not to have been hitherto utilized except by the natives, who esteem the ulikon as a great delicacy. The oil at present is said to be gaining a high reputation in this country, and has recently been introduced into England, where it will probably take "a prominent place as an important medicine."

During November there was mined at the Blossburg collieries, N. M., 2,941 tons of coal, and at the Savage collieries, 2,693 tons, making the total output of the Raton Coal and Coking Co. for the month, 5,406 tons.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:

Saturday Morning, Feb. 11, 1882.

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Passing Events.

Although there have been indications of rain several days during this week in this region, up to the present writing (Thursday) none has fallen. In the mountains the weather has been quite cold and has greatly interfered with mining operations.

It will not now be many weeks before prospectors will begin to go out again into the mountains as the sun is fast climbing north and lengthening the days. The coming season promises to be a lively one, as a great interest has developed in mining matters, and the area in which mining is carried on is being rapidly widened.

Further news from the Jeannette expedition this week gives some of the details of the cruise and announces that some of the men are on the way home. No tidings, however, of the brave leader of the expedition have been received.

MICA.—A mica mine at Deadwood is said to have been sold for $37,500. It has an immense ledge, and over 10,000 lbs. have already been shipped. There are many dozens of mica mines in this State, but no one even made $3,750 out of one, much less $37,500. The North Carolina mine, which produces such excellent mica, yields enough to supply the United States. As one company has a monopoly of the handling of this product and owns this mine, there is not much encouragement for others to open mines. It is only first-class clear mica, which comes in large sheets, that can be marketed.

HENRY G. HANKS, State Mineralogist, has sent a communication to the Board of Education inviting the board and the teachers to avail themselves of the privileges afforded by the State Mining Bureau.

Geology and Juries.

It is a very common thing in the trials of mining suits for a mass of testimony to be introduced regarding the cause and manner of the formation of mineral veins or deposits. In doing this a few experts are enabled to air their geological knowledge, bring forward their pet theories, and endeavor to prove that because the Lord Almighty made one or two mineral veins or deposits with which they are personally familiar, in a certain way, all other mineral veins or deposits must be also made in the same way. If they are not made in this way, then they are not mineral veins or deposits, but something else not known to geology, and therefore not to be considered.

The technicalities of any profession are confusing to any one not of that profession. We can scarcely, however, conceive anything which could be more confusing than a geologist's description of geological features to a set of men with no knowledge of geological terms. Yet juries have to stand hours and hours of such talk, which even the lawyers hardly understand.

That a great deal of time and talk is wasted in trials of this sort, there is no doubt; and that it does much good is also a subject of doubt. It has remained for an Arizona judge, however, to officially discountenance the practice, by stating that the jury have more to do with the veins themselves than with theories as to how they were formed.

In the recent Contention-Head Center suit at Tombstone, the defendant asked Judge Stillwell to give the following instruction to the jury:

"If the jury find from the evidence that after the porphyry dike existed, a fissure was made in the dike and adjacent rock with defined walls and clay selvages, and that the fissure was filled with ore of gold and silver, and that from this fissure at certain points the adjacent porphyry and shale was mineralized, they should find this fissure a vein, lode or ledge within the meaning of the act of Congress."

And the judge on giving his charge to the jury, said:

"I cannot give you that instruction, gentlemen, for the reason that I am not of the opinion that it makes much difference as to when or how the fissure was formed, and your opinion and verdict better be based upon what miners consider veins, ledges and lodes when they find them, than upon a theory or conjecture as to when or how it may have been formed."

Locking Miners' Lamps.

Before safety lamps were invented the loss of life in coal mines from explosion of fire-damp was frequent and great. After the lamp was devised and put into use, this was lessened, but it was found that explosions frequently occurred even then. Strict regulations were enforced against the men taking matches into the mine, but still explosions occurred. It was then found that the men would unfasten and open the lamps, notwithstanding they risked their own lives and those of their fellow workmen in doing so. The lamps were locked, but the locks were picked by the miners. All sorts of devices have been tried to keep the lamps securely locked, but as many ways for overcoming the precaution have been got up by the miners.

It seems strange, but it is none the less true, that the men cannot be trusted in this matter, and that so much trouble must be taken by the mine owners to save the men's lives; and that the main danger comes from these very men themselves. The men will evade the laws and the company's regulation and risk their own lives for a surreptitious smoke, taking the chances of an explosion. Of course all miners are not so reckless, but enough of them are to make it necessary to exercise every precaution to prevent the men getting at the flame of the lamps.

For this reason Schondorf's locking arrangement for miners' lamps is finding extended application in Saxony. In Schondorf's lamps a locking pin is used which cannot be got out of its place by any external means within the miner's reach, but only by a powerful magnet. As a horseshoe magnet of sufficient power for this purpose weighs about 8 lbs, or 9 lbs., and costs about $10, it is not likely that a miner will carry one in his waistcoat lining or boots, or invest the money for a surreptitious smoke. This is the newest thing, and it remains to be seen how the miners are going to get away with the magnet.

TWENTY-FOUR PAGES.—The San Francisco MINING AND SCIENTIFIC PRESS last week consisted of 24 pages, and our readers are reminded that this number is one worthy of preservation for future use. Its annual review fills nearly five closely printed pages, and it gives in a comparatively brief space a resume of the condition of the mining industry over a very large territory. It has compiled, also, such statistics of bullion production, etc., as will be interesting in this connection. The latter work shows a great deal of information in a brief space. Although the review may seem somewhat extended, it is really brief, when the ground covered by it is considered.—*Inyo Independent.*

Fuel for Blowpipe Assays.

In making assays with a blowpipe, when more convenient material is not at hand, stearine candles of good quality will answer for most purposes. Parrafine candles give a higher heat, but they soften in warm weather, and melt and run down inconveniently. The common tallow candle may often suffice in an emergency, but requires constant snuffing.

Brush, in his "Determinative Mineralogy and the Blowpipe," gives a preference, when gas is not procurable, for olive or rape-seed oil, burned in a lamp having a single circular wick rather more than a quarter of an inch in diameter, if the wick tube or lamp be so arranged that the charcoal or other supports used in blowpipe experiments can be brought close under the deflected flame.

The form of blowpipe proposed by Berzelius, and improved by Plattner, is well adapted for a portable blowpipe apparatus, since it is free from leakage and capable of packing into a small space. The cistern is of tinned sheet iron, and the wick tube and filling orifice are closed by screw caps.

The most convenient combustible is, of course, illuminating gas. The burner, about four inches high, is convenient; the tube is flattened at the top, and made a trifle lower on the left side, so that the blowpipe flame may be turned downward when necessary. A cock in the tube at the foot is useful. Such a lamp has the advantage of dispensing with all trimming and other inconveniences attendant on the use of an oil lamp. The ordinary Bunsen gas burner is often provided with an extra tube to slip over the small gas jet in the interior of the burner in such a manner as to shut off the access of the air; the gas is then burned from the upper end. The only objection to this lamp is, it is a little too high, although it may answer for all ordinary purposes.

A simpler blowpipe gas lamp may be easily made by selecting an iron or brass tube, eight inches long and three-eighths of an inch bore, bending it at a right angle at the middle, and passing it through a block properly cut, or placing it in a small circular mold for a base, which is then filled with melted lead. The top of the tube is then flattened, and the proper inclination given to the orifice by filing.

Mining Boats.

We have several times mentioned the fact that the different mining boats, vacuum dredges, pumps, etc., tried for raising the gold from the bottom of our California rivers, have all proved failures. Hundreds of thousands of dollars have been expended in the experiments by people sanguine of success, and who have ignored the experience of others.

To show that this experience is ignored, the following paragraph from an Eastern paper is given: "A new system of gold mining has been introduced in Georgia, what is called a vacuum dredging boat having been successfully tried on the Chestatee river. It is designed to raise the gravel from the beds of the rivers, washing the sand and separating the gold from it. At a recent trial the boat raised the sand by the vacuum system at the rate of from two to four tons every five minutes. The sand was rapidly washed automatically in sluice boxes and the gold collected in quicksilver. As the result of three hours' work, $200 worth of gold was secured. The expense was not more than $12. The sand was found to be very rich, and it is said there is enough in the rivers in Georgia to keep 50 boats busy for 50 years."

As a commentary on what the result of this will be, we give the following item published the same week as the above, but this is from the Gridley (Butte Co. Cal.) *Herald:* "Many of our readers will remember the mammoth mining boat constructed upon the Shaeffer & Parks ranch several years ago by the Newton Hydraulic M. Co. The craft and machinery cost in the neighborhood of $45,000. After sinking between $80,000 and $90,000, the projectors of the scheme became satisfied that the gold in the bed of the Feather river could not be extracted after that fashion, and operations were suspended. The machinery was taken off and the hull abandoned. A short time since L. P. Denny of this city bought the boat and now has a gang of men at work tearing it to pieces and saving the lumber."

Any gentlemen East who are going into mining the beds of rivers, and are going to use boats in their search for gold, had better find out something of the history of this kind of mining first. Then they had better watch experimental trials carefully. These boats generally pump more money out of the stockholders' pockets than ont of the river beds.

THE Trinity *Journal* publishes a statement that makes a showing of $437,779.50 gold dust and bullion shipped by express from Trinity county during 1881, and thereupon makes the following remarks: As the gold bullion and gold dust passing through the express office in Weaverville exceeds $400,000, and this is fairly estimated at about one-half the production of the county, the entire gold yield for the year 1881 may be reasonably estimated at double that amount, or $800,000. This amount is a splendid showing for a county of less than 5,000 population, including Chinese.

Boss' Continuous System for Working Ore.

In all the history of amalgamation the principle has been to produce contact between the ors and quicksilver (after preparatory chemicals, if used).

It is an unfailing principle that gold and silver will amalgamate when brought into healthy contact with quicksilver.

To bring about this contact our Spanish-American neighbors, by the patio, produced a very slow and incomplete contact and waited for the action of time to complete the work. The arastra was quicker, keeping a constant, but very moderate, agitation.

The "Washoe pan" was an improved arastra, working quicker and having more working surface. It was a long stride ahead. That, in its earlier days, did its work almost entirely between shoe and die. The pulp was necessarily thick to carry quicksilver and heavy particles in suspension throughout the mass, that all might take its regular turn in the activity between the working surfaces.

In course of time the "Washoe pan" improved in its efficiency. The contact of particles was made vigorous throughout the pan. This was attained by making the current proper and powerful and the pulp thin. By this, no sluggish grains of ore rode quietly around near a head of quicksilver. Attrition, friction, contact, business in active throughout the mass.

When pulp was required thick for the pan, it was necessary to settle it in tanks, but now, when pans are to be had that will handle the thinnest and heaviest pulp without concentration at the bottom, it is wholly unnecessary.

The continuous system of working ore, by which all the pans and settlers are connected, and the pulp from battery run directly into the first pan, which overflows into the second, and so on through them all, the quicksilver running into and out of the pans separately from the pulp, is no radical change of the working within the pan. It simply requires that pans and settlers be up to the standard of the day that no concentration take place within them. The business within the pan is the same, except that the individual particles of pulp, instead of remaining in one pan to receive all of its action, pass in turn throughout them all, having the advantage of being of lower grade, and meeting with fresh quicksilver in each succeeding pan. With an ore proper for amalgamation, there can arise no question whether this system can work it.

In a milling proposition the question does not arise, is this system suitable for this character of ore? But how many pans are required for working a given amount of this ore? The system was first put into operation at the Noonday mill, in May, 1880. It has been in constant use there from that day to this, giving fullest satisfaction in its labor saving, working percentage and small loss of quicksilver. In every mill in which the patentee has personally introduced it, and in every mill that has observed his ideas of pans and settlers, it has been an unceasing success.

PACIFIC COAST STEAMSHIP CO.—The stockholders of the Pacific Coast Steamship Co. met on the 6th of February and elected the following officers: Directors—Charles Goodall, C. H. Prescott, John Rosenfeld, William Norris, George C. Perkins, J. L. Howard and Edwin Goodall. The Directors met on the next day and elected the following officers: President, Captain Charles Goodall; Vice-President, John Rosenfeld,; Secretary, Edwin Goodall; General Agents, Goodall, Perkins & Co. It is quite a mistake to suppose that the change of officers will take any business away from San Francisco. In relation to the supposed change of ownership Governor Perkins says: "It is true that Henry Villard now holds the controlling interest in the stock of the company, but the management is in precisely the same hands and the business will be conducted nearly in the identical manner that it has been in the past. The firm of Goodall, Perkins & Co. remain the agents, and though the main offices will in future be located in Portland, that will make no difference to the nature and amount of business transacted in San Francisco. Goodall, Perkins & Co. are also the agents for the Oregon Railroad and Navigation Co."

SAFETY FIRE ALARM.—A great fire was doubtless obviated in the Baldwin hotel of this city this week by the automatic fire alarm. Wires from this electrical fire announcer are laid in every room. Should the temperature in any place raise above a normal state, an alarm is sounded in the porter's room and the office, and the locality of the unusual heat is also indicated. In this case the fire occurred at four o'clock in the morning up under the roof directly over the Baldwin theater stage, in the hotel. The alarm rang and called the attention of the night watchman. All the employees were aroused, and with three streams from the hotel hose the incipient conflagration was checked. A simple invention thus saved large loss of property.

SINCE the Bullionville furnace shut down, the Pioche *Record* says, the town has relapsed into its former quietness, and all it requires now is a large-sized shroud to bury her out of sight.

The Art of Firing.

[Written for the Press by C. H Aaron.]

The writer, when in charge of quartz mills, has a number of times gone into the boiler-room and put the steam up to the required pressure, when the engineers confessed their inability to do so. It is true these engineers were not men of high-standing in their profession, but they were such as it is often necessary to employ in the mines at least, and very good men on the whole. One in particular was agreeable, intelligent, industrious and conscientious, and, though not a machinist, had been engaged as a "runner" of engines from boyhood, and could put an engine into excellent working order and keep it so. The draft was not very strong, and the interior walls of the furnace had fallen, leaving a cavern under the boiler in which nearly half a cord of wood might be placed; the distance of the grates from the boiler was greater than it should have been, and there was neither time nor material for alteration or repair, the engine having been called on merely as an adjunct to a water power which was diminishing day by day.

At last it became necessary to do the work entirely by means of the engine, which required at least 40 lbs. of steam pressure, and then this excellent man declared, while the sweat poured from him, "It's no use, Mr. ———, I can't keep up steam."

It would have been unjust to blame him, for the circumstances were certainly disadvantageous, and he had evidently tried his best. He was requested to go to the shop and repair the blower for the tubes, which was out of order, the writer taking his place at the engine. The water in the boiler stood between the second and third try-cock, the steam gauge indicated something less than 30 lbs. The furnace was full of fuel, fresh wood at the top and a thick bed of coals on the grate; the boiler plates were covered to the thickness of half an inch with black soot, with which the tubes were also lined; a dense column of black smoke poured from the stack.

In the course of 20 minutes the engineer returned in search of some tools, or perhaps to see how things were going. He found three gauges of water, and 40 lbs. of steam pressure. In another 20 minutes he returned again, with his blower ready for the tubes, and found three gauges of water, and 51 lbs. of steam pressure, his substitute being as cool and comfortable as though he had been sitting in a parlor, instead of running a 60 horse power engine. In fact, beyond putting in a very small quantity of wood toward the last, the substitute had done absolutely nothing, except attending to the feed and throwing the fire-doors wide open, until the smoke from the stack began to clear, when they were first partially, and then completely closed. The soot had all disappeared from the boiler plates, and but little remained in the flues. A thin layer of coals covered the grates; the newly introduced wood was burning brightly, and the smoke was barely visible. "By the gods, you can beat me at firing!" was the engineer's remark, but thenceforward he had no trouble in making all the steam required. He had thought it necessary to keep that immense furnace stuffed full all the time, in order to bring the fire close up to the boiler. He had wasted a large quantity of wood, a great part of which had gone up the stack, in the form of smoke and gas—had exhausted himself by sweating and toiling, and had not been able to keep 30 lbs. of steam pressure.

The man, being intelligent and not disdaining instruction from even a "scientific cuss," heard and profited by a short lesson, somewhat as follows, on

The Philosophy of Combustion.

A given quantity of fuel requires a certain quantity of air to enable it to burn. The quantity of air which can pass through a furnace depends on the ease with which it can enter, and the force of the draft; and the draft is limited by the form and dimensions of the flues and stack, or chimney, and the difference of temperature between the interior of the stack and the external air. Carbon, as coke or charcoal, in lumps, that is, the "coals" which are formed in a fire of wood or coal, burns only on the surfaces of the pieces, the inside portions remaining unchanged until exposed by the gradual burning away of each piece. Wood and coal contain not only carbon, but also substances which, when heated, expand into gases, most of which are combustible, but which require a certain degree of heat to ignite them, and a certain proportion of air to enable them to burn.

The conversion of the volatile substances in the fuel into gas absorbs a great deal of heat; and if the fuel contains a little moisture, as it generally does, the moisture is converted into vapor, also absorbing a great deal of heat. When wood or coal is thrown into a hot furnace, the first effect is to cool the furnace, not only because the fuel is cold, but also because of the expansion of the volatile matters into the gaseous form. As soon as the gases become sufficiently heated, they will burn if air is supplied, and will then produce heat; but if not sufficiently heated, or if air is lacking, they cannot burn, and they go up the chimney in the form of smoke, depositing soot, which is carbon in powder, upon the boiler, in the tubes and in the stack. Soot is one of the worst conductors of heat known, so that the evils resulting from a failure to burn the gases are many. Firstly, the heat which they would produce if burned is lost. Secondly, the heat which they absorbed in their expansion is lost. Thirdly, the soot deposited in the flues obstructs the draft and thus diminishes the possible amount of combustion in the furnace. Fourthly, the soot coating the boiler plates and the inside of the tubes tends to prevent heat from passing to the water in the boiler.

From the foregoing it is plain that if a large quantity of fresh fuel is thrown into a furnace at once, some time must elapse before the gases evolved can become hot enough to burn, even if air is present in sufficient quantity; but, besides this, the large volume of gas produced tends to fill the furnace and flues, supplying in a great measure, or even entirely, the demand of the draft, which, moreover, is diminished by the cooling effects described; thus little or no air can enter, and all the evils mentioned follow of necessity.

It is almost impossible, unless with the best and dryest wood or coal, to fire without producing some smoke, but to prevent this as much as possible the rule for the addition of fuel is, *a little at a time*, and then no more until that in the furnace is in active combustion. In this way it will soon be known how much fuel can be accumulated in the fireplace with good effect. The fireman should watch the stack, and as long as a heavy smoke comes from it, the further addition of fuel will be worse than useless. When the smoking ceases, more fuel may be added if required, but a too thick bed of coals on the grate does harm by obstructing the passage of air.

The Perfect Combustion

Of fuel produces no visible smoke, yet the absence of visible smoke is not a proof of perfect combustion in all cases. The perfect burning of coke or charcoal makes carbonic acid gas (carbon dioxide) which cannot be further utilized, but the imperfect combustion, caused by a deficiency of air, makes carbonic oxide (carbon monoxide), an invisible but combustible gas which burns in presence of air with a purplish-blue flame. When the bed of coals on the grate is too thick for the quantity of air passing through it, perfect burning takes place at the bottom with a great development of heat, but the carbonic acid gas thus formed, in passing through the red-hot coals, undergoes a reversal of combustion, so to speak, takes up carbon, losing heat in so doing, and is converted into carbonic oxide, and there may be a loss of heat and a waste of fuel in this way, without any visible smoke.

If Air be Admitted

Above the fire, this gas will burn and produce heat; if not, it goes up the chimney unburned. If fresh fuel is thrown in while the furnace is full of this gas, and there is no air to enable it to burn, it is clear that the gas from the fresh fuel must also be lost, and smoke produced. On this account ventilators are usually placed in the fire doors, in order that some air may be admitted above the fire in case that not enough of it can pass through.

Too much air, though not so bad as too little, is injurious by needlessly reducing the intensity of the heat. For this reason, the ash-pit has doors which may be partially or wholly opened at pleasure, and with ventilators, as well, generally. The fireman should so regulate the damper as to have rather more draft than is generally required, and then control the access of air below the grate by means of the ash-pit doors and ventilators, and above the fire, by the ventilators in the fire doors, so as to obtain, as nearly as may be, perfect combustion, and at the same time, the highest possible heat with the least possible consumption of fuel.

The quantity of heat produced depends upon the quantity of fuel which is completely burned, but the intensity of the heat is in proportion to the quantity of fuel completely burned in a given time and space; and space must be considered to include not only the dimensions of the fireplace, but also the volume of air which passes through it in the given time, because all of this air must be heated. The more intense the heat, the larger the proportion of it which passes into the water in the boiler. We might burn a hundred cords of wood under a boiler and not make the water boil, if it took a week to each cord; or a cord a minute, in as little purpose, if the fireplace were as large as the Palace hotel, or if a great excess of air rushed through the fireplace, because, in either of these cases, though the same quantity of heat would be produced, it would never acquire sufficient intensity beyond the immediate surfaces of the burning particles.

The above principles are applicable to the management of roasting furnaces and the domestic stove, as well as to firing under a steam boiler, and many housewives would save both trouble and expense by giving some attention to them. Water can be heated much faster in a kettle with a clear bottom, than in one which is thickly coated with soot, and a clear burning fire will afford more heat with less fuel than a smoky one. When a stove is too hot, the draft should be checked, chiefly at the bottom, instead of in the pipe, and some air admitted above the fire.

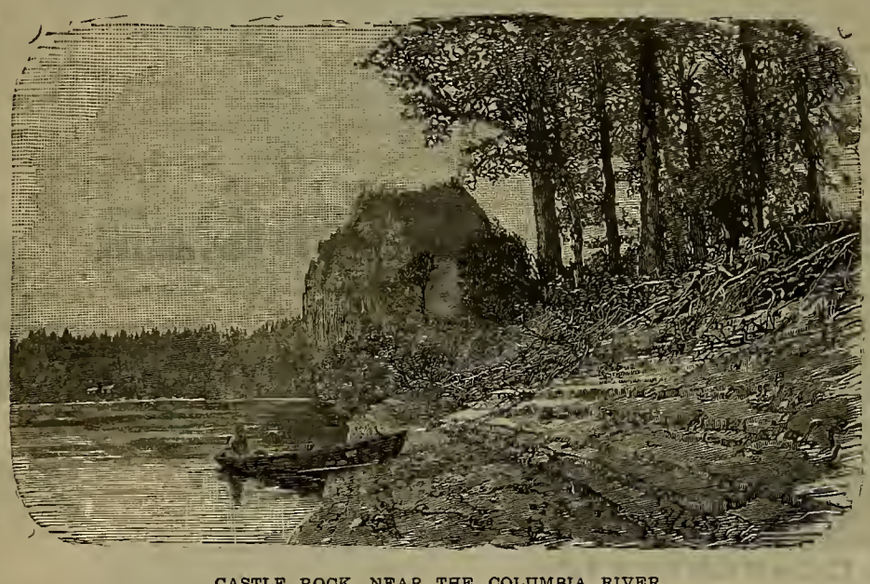
A Scene on the Columbia.

We give our readers this week another glimpse of the enchanting scenery of the Columbia, the majestic river of our northwestern region. Along the northern line on the Columbia river, says a writer in the *Resources of Oregon and Washington*, may be found some of the grandest scenery in the known world. It is here that we find solemn old Castle Rock, nestled among the willows and dogwood of Washington Territory, covering 13 acres of land and towering above the water's edge for over 800 ft. It is the property of Jay Cooke, of New York city, and doubtless excites a feeling of pride within him as he looks back through the veil of the past, and as memory joins hands with imagination he sees coming generations pass up and down the Columbia—this great thoroughfare of the west—and Castle Rock is accorded the pride and admiration of a great nation. Not only is it grand of itself, but it is in the midst of scenery most sublime. Above it are the lower rapids of the Columbia, seething, whirling and boiling as the water comes rushing over the rocks. Below it stands the symmetrical Rooster Rock, standing alone and reaching above the water's edge for 300 ft. Below this, Lower Cape Horn stands boldly out in the river, and presents an unbroken front of basalt 300 ft. high, worn by the overdripping streams of water until the grooves and hollows present a scene both picturesque and sublime.

The time was, and in the memory of our fathers, when no land was so distant, so forsaken as this. Bryant, in casting about for an example of utter desolation, exclaimed:

> "Take the wings
> Of morning, pierce the Barcan wilderness,
> Or lose thyself in the continuous woods
> Where rolls the Oregon, and knows no sound
> Save his own dashing."

Now, however, the deathly stillness that once reigned supreme, is broken by the noise and clangor of busy craft hurrying from point to point in the interest of commerce, while along the shores hundreds of men are blasting and drilling, preparing a course for the iron horse, that in so few months will be speeding away to the Eastern States from Portland, Oregon, to Portland, Maine.



CASTLE ROCK, NEAR THE COLUMBIA RIVER.

Academy of Sciences.

The regular meeting of the California Academy of Sciences was held on Monday evening last. President Davidson in the chair. Donations to the museum were as follows: From G. P. Rixford, seven mortars and pestles from the ancient Timbalakees' village on the west side of Sonoma valley, where mussel shells, obsidian chips and occasional arrowheads are plowed up. From Turton A. Knox, a very large and perfect mortar and pestle, excavated one mile west of San Joaquin river, in Railroad cut. From the New Hebridee islands, a native image, said to be a religious emblem, life-size, in human form, surmounted by a skull, brought into this port by Capt. S. Simonson, of the American brig *Sea Waif*, from Malicolo. From Capt. Johnson, of steamer *Orizaba*, fishes from San Pedro, California. From Dr. A. Krause, a rare fish from the Okhotsk sea. From B. B. Redding, a mammoth barnacle, from China. From T. Harmon, coral from Monterey. From Capt. S. Simonson, snake from Fiji islands. From A. C. Tichnor, large specimens of quartz with tourmaline crystals, from Kern county; also a species of topaz.

Charles W. Friend, of Carson, Nev., presented his annual meteorological report.

A letter of thanks was received from the Bremen Geographical Society for kind attentions shown their members, the Drs. Krause, by the Academy. Another letter was read from that society, asking the Academy to acknowledge the first discovery of Wrangel Land by Capt. Dallman, in 1866, which was referred to a committee of the Academy to consider and report upon. The committee consists of Charles G. Yale, Capt. R. W. Simpson and Charles Wolcott Brooks.

W. G. W. Harford read a paper on the "Angel Fish," a variety which has attracted some little local attention of late. He exhibited the specimens in the museum and showed that the fish had long been known to science, current reports to the contrary notwithstanding.

A paper by Mrs. Dr. Mary Corran was read by Dr. Harkness on "Cœnaurus of the Hare." This is a species of tapeworm, found in the wild hare of California. Attention was first called to the swellings on the loins and thighs of hares for sale in our markets, which are called by hunters and dealers "water blisters" or "water boils." These swellings do not occur in the smaller species, called rabbits. The cause of these swellings is the larvæ of the tapeworm. Tapeworms are true parasites, and are found not only in animals, but in man, in the latter originating from "measley pork," or beef infested with larvæ.

The natural hosts of the *cœnaurus* are the dog and wolf. The coyote finds a hare with this disease an easy prey, and swallows the larvæ with the flesh. The thousands of worms are set free in the stomach and begin their growth if they succeed in fastening themselves to the walls of any part of the intestines. Each joint of the worm is complete in itself, and contains thousands of eggs. The eggs being received into the stomach of a hare, have their outside envelope removed, and the embryo being set free penetrates the walls of the intestines and at last finds its way to the loins or thighs where it develops the vesicles first described.

As far known this species of worm does not develop in man. But as a matter of precaution it should be seen to that the hare prepared for the table be thoroughly cooked. People owning dogs should be careful not to let them eat raw any of the hare with these "water boils."

The following curators of the different departments have been appointed for the year 1882 by the Council, the scientific governing body of the Academy: Mammals and birds, E. F. Lorquin; ichthyology, Charles G. Yale; geology and paleontology, E. T. Cox; ethnology and osteology, A. B. Stout; botany, J. P. Moore; entomology, H. Behr; conchology, Josiah Keep; mineralogy, C. D. Gibbes.

The publication committee for 1882, appointed by the Council to edit the publications and decide upon whether the papers read are worthy of publication, consists of Prof. George Davidson, Justin P. Moore, Charles G. Yale, Dr. H. Behr and John M. Stillman.

The Gold Hill *News* says: By running their portion of the Sutro tunnel the Overman people made a saving to the company of at least $20,000, for the charges of the Tuonel Co. are $70 per linear foot, which is in excess of the cost where the mines run the drift themselves. It was good management on the part of the Overman superintendent, and it facilitates the connection besides.

The gross output of the Hecla Consolidated Mining Co., at Glendale, M. T., for the 13 months ending Dec. 31, 1881, was $874,112.40; expenses, $636,383.73. This places the net profits at $237,728.77, which is over 15% per annum on the $1,500,000 capital stock of the company.

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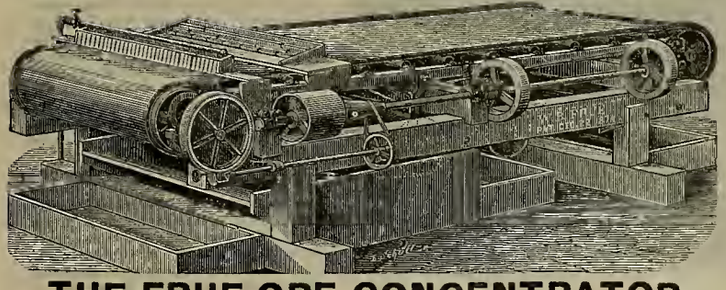

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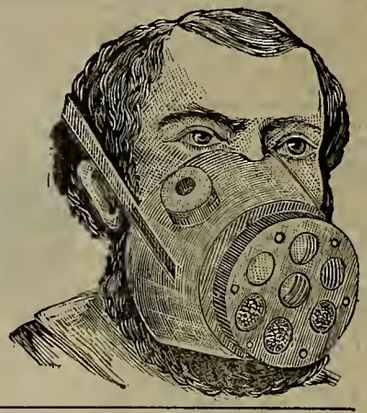

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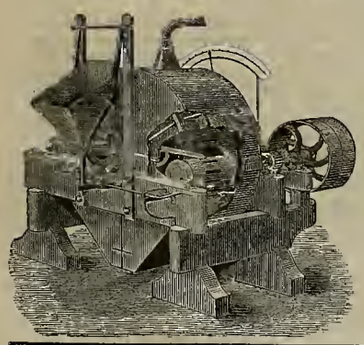

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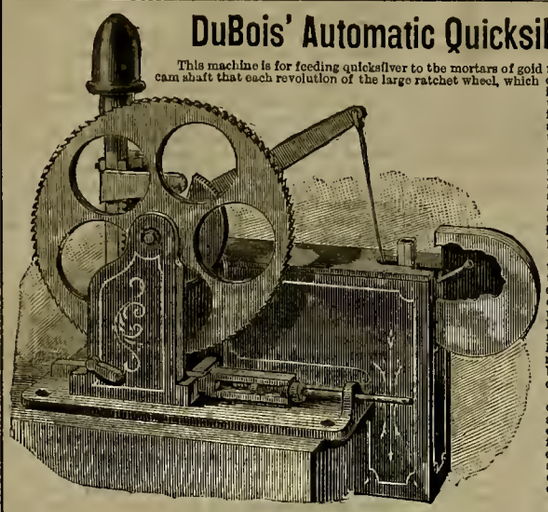
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING JANUARY 31, 1882.

252,935.—OVERALLS—C. Adler, Alameda, Cal.
253,035.—FRUIT CAN—F. B. Ginn, Oakland, Cal.
253,036.—SEALING CANS—F. B. Ginn, Oakland, Cal.
253,166.—BALANCED VALVE—W. D. Hooker, Oakland.
252,884.—STEAM COOKING APPARATUS—J. H. Linney, San Francisco, Cal.
252,889—CABLE RAILROAD.—Wm. McCall, S. F.
252,966.—HYDRAULIC ELEVATOR—Geo. L. Pierce, Oakland, Cal.
253,121.—QUARTZ CRUSHER—Chas. P. Stanford, S. F.
253,106.—WATER CLOSET—Wm. M. Sack, Oakland, Cal.
253,107.—FILTERING FAUCET—Wm. M. Sack, Oakland.
253,131.—MOP AND SCRAPER—John E. Tiffin, Redding.
253,141.—FOACE PUMP—M. L. G. Wheeler, Oregon City, Oregon.
253,145.—DREDGING MACHINE—Z. Williams, Oakland.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

WATER CLOSET.—Wm. M. Sack, Oakland. No. 253,106. Dated Jan. 31, 1882. This improvement in water closets consists in a novel arrangement of a gate or valve which closes the bottom of the bowl, and is operated by appropriate mechanism to prevent at all times the upward escape of odors or foul air. In combination with this valve the inventor employs a chamber having within it a flexible diaphragm and pipes to admit water to each side of it alternately, so that while one side is being emptied the other will be filled. This diaphragm is connected by a rod and levers with a valve, and a cock is operated by a lever connected with the seat so that the admission of water upon one side of the diaphragm causes it to move and withdraw the rod and levers so that the valve may be opened at the proper time; but the valve is prevented from opening, while the seat is occupied, by a catch actuated at the same time with the opening of the cock. As the diaphragm moves back it forces a supply of water into the bowl. When the seat is released the cock is turned so as to reverse the flow of water and move the diaphragm back to its first position. At the same time the cock releases the valve and allows it to swing open and discharge the contents of the bowl into the soil pipe, and the return of the diaphragm closes the valve while supplying water to wash the bowl.

CABLE RAILWAY.—Wm. McCall, S. F. No. 252,889. Dated Jan. 31, 1882. This improvement in cable railways consists in a novel combination of rollers or sheaves, which are set upon a curve, so as to carry the cable around it and support it in the proper position, and at the same time allow the grip from the car to be moved around the curve in a regular line corresponding with the line of the slot, and be supported upon two or more of the sheaves at once during its passage around the curve. The grip is so constructed that it may be opened at any point in the curve so as to allow the cable to move through it while the car is stopped. The invention further relates to a means for guiding the cable while changing its grade, and for preventing its striking the upper part of the tube at such points, by means of a sheave or pulley supported upon a swinging arm, which is adapted to be moved out of the way by the passing grip, and is returned to its position after the grip has passed.

STEAM COOKING APPARATUS.—John H. Linney, S. F. No. 252,884. Dated Jan. 31, 1882. This invention relates to certain improvements in steam cooking apparatus; and it consists of a series of pans or sections placed one upon another above a steam boiler, and having one or more continuous tubes extending from the boiler to the upper chamber, and provided with valves having stems extending to the outside, so that steam may be admitted to either or all the sections, or cut off from the outside. All the sections, except the upper one, are provided with doors, which may be opened to examine the progress of the work, and the food in any section may be removed without interfering with either of the other sections. The doors are provided with guards to prevent the condensed steam from running down outside the chambers, and small openings are made into the steam tubes at the level of the floor of each section to allow condensed moisture to escape.

FILTERING FAUCET.—Wm. M. Sack, Oakland: No. 253,107. Dated Jan. 31, 1882. This invention relates to certain improvements in that class of faucets which also serve to filter the liquid passing through them, and is an improvement upon a patent issued to the same inventor May 10, 1881. It consists mainly in certain improvements in the construction, the principle being the same.

Recent Contributions to the California State Mining Bureau.

[Furnished by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

Scapolite—Templeton, Ottawa county, Canada.
Anthophyllite, Wilcoxite—Franklin, North Carolina.
Titanite—Arendal, Norway.
Augite and Titanite—Ottawa, Canada.
Ledererite, Gmelinite—Grattan, Ottawa county, Canada.
Phlogopite—Templeton, Ottawa county, Canada.
Phosphatic Nodule, Phosphorite, Lahn—Nassau.
Phosphorite, Land Phosphate—Ashley Key, South Carolina.
Phosphorite, Caceres—Spain.
Phosphorite, Cretaceous—Ardennes, France; with fossil ammonite.
Phosphorite, River Phosphate—Coosaw, South Carolina.
Fossil Shark Teeth, Carcharodon Megalodon (Tertiary)—Charleston, South Carolina.
Fossil Shark Teeth, Carcharodon Angustidens (Tertiary)—Charleston, South Carolina.
Fossil Horse Teeth (Tertiary)—Charleston, South Carolina.
Oliva Litorata, Pliocene Tertiary Fossil—Young's Island, 66 miles south of Charleston, South Carolina.
Natica Duplicata, Pliocene Tertiary Fossil—Young's Island, South Carolina.
Arca Incongrua, Pliocene Tertiary Fossil—Young's Island, South Carolina.
Tellina Alternata, Pliocene Tertiary Fossil, Young's Island, South Carolina.
Artemis Concutrica (?), Pliocene Tertiary Fossil, Charleston, South Carolina.
Scutella Cumquephora, Tertiary Pliocene Fossil, Young's Island, South Carolina.
Terebra Sp. (?), Pliocene Tertiary Fossil, Young's Island, South Carolina.
Lutraria Caniculata, Pliocene Fossil (Tertiary)—Young's Island, South Carolina.
Pyrula Preversa (?), Pliocene Fossil (Tertiary)—Young's Island, South Carolina.
Pyrula Carica, Tertiary Pliocene Fossil—Young's Island, South Carolina.
Two Hundred and Sixty-five Species of Fresh-Water Shells—Eastern States. Purchase.
Copper Ore—Pioneer mine, Bolenas Bay, Marin county, Cal. Assay: Gold, trace; silver, $22 per ton; copper, 10%, 11%. Frank Attwood.
Inclosing Rock, with Microscopic Section—Pioneer mine, Marin county (see No. 3358). Frank Attwood.
Anglesite-Fluor Spar and Wulfenite—Castle Dome District, Arizona. F. H Staples.
Hematite and Magnetite—Near Crescent Mills, Plumas county, Cal. A. Jacobs.
Bill or Snout of the Saw Fish, Pristis Antiquorum.
Cyprus Wood—Monterey county, Cal. J. Z. Davis.
Vase of Granite—From the quarries of Penryn, Placer county. Griffith Griffith.
Block of Basalt—Used for street pavement. Mt. Pisgah quarries, one mile south of Petaluma, Sonoma county. Luther Wagoner.
Gold from Quartz-Crescent Mills, Plumas county, Cal. Barney Tutt.
Hematite—Township 4 north, range 10 east, opposite Section 3 in unsurveyed land, 2 miles southeast of Campo Seco, Calaveras county, said to be in large quantities, and to be of easy access. A. M. Thrift.
Sulphur, Cinnabar and Gold—Large specimen: Manzanita mine, Sulphur Creek, Colusa county, Cal. C. B. Hughes.
Rich Copper Ore, Principally Cuprite—Reward mine, Genesee valley, Plumas county, Cal. S. E. Swearingen.
Grape Shot and Musket Ball—Found on Washington's first battle ground, Fort Necessity, which he defended with 500 Virginia militia against 1,500 French and Indians, under Jamonville. Having dictated the terms of his own surrender, Washington marched out with drums beating and colors flying on the 4th of July, 1754. Donated by Capt. H. A. Gorley.
Indian Relic—Hoosian Nalan Indian Rancheria, Curry county, Oregon. W. B. Mason.
Limestone Concretion Bearing a Curious Resemblance to a Fossil Turtle—Found 7 miles northeast of Santa Cruz and a little east of Big Tree grove. J. Z. Davis.
Silver Ore—Mina Faisan, Panuco Mining Co., Sinaloa, Mexico. Mark Cornish.
Phosphate of Alumina, Probably Trolleite—Columbus, Esmeralda county, Nev. C. F. Allen.
Nitrate of Soda, Crude—Niter hill, near Lovelocks station, Humboldt county, Nev. A. J. Ralston.
Refined Nitrate of Soda—Lovelocks station, Humboldt county, Nev. (see No. 3775). Crystallized for the State Mining Bureau by Ad. Sommers, manufacturing chemist.
Borax, Refined—Teel's marsh, Esmeralda county, Nev. Wm. T. Coleman & Co., agents for the works.
Borax, Refined and Pulverized—Smith Bros.' Works, Esmeralda county, Nev. Wm. T. Coleman & Co., agents.
Borax, Refined—San Bernardino county, Cal. Wm. T. Coleman & Co., agents.
Borax, Crude; Natural Product, First Quality—Smith Bros., Esmeralda county, Nev.
Borax, Crude; Natural Product, Second Quality—Smith Bros., Esmeralda county, Nev.
Ulexite, Borate of Lime—Smith Bros., Esmeralda county, Nev.
Rock Specimen, Undetermined—Five miles from Shingle Springs and 4 miles northeast of Latrobe, El Dorado county. Cal. M. T. Grogan.
Borax, Granulated—Teel's marsh, Esmeralda county, Nev. Wm. T. Coleman, agents.

THE Los Angeles *Herald* says: The probability is that Senator Jones spent, first and last, fully $1,000,000 in the attempt to show up a mine in Panamint, with the result of a most disastrous failure. In the case of the Resting Springs district several very wealthy Angelenos sunk a couple of hundred thousand dollars.

WITH only a five-stamp mill and two arastras, the mines of the Batopilas Co., Sonora, have yielded $600,000 in silver bars, and about one-quarter as much in first-class ore—this latter being native silver—in 18 months.

ADVICES from the Klamath, Lower Trinity, and New rivers, are to the effect that the mining season has opened more favorably than for years, and that from present appearances mining operations generally will be very successful this year.

News in Brief.

THERE is a disastrous flood on the Brazos river, in Texas.

RAIN and snow in the mountain and foothill regions on Sunday night.

GUITEAU, the murderer of the President, has been sentenced to be hung on June 30th.

WASHINGTON TER. is free from debt and has a surplus of over $30,000 in her treasury.

IT requires a general smallpox scare about once in so often to keep the people vaccinated.

A LOT of Chicago restaurant proprietors have been prosecuted for supplying their tables with butterine.

CHAS. B. FOSTER, the noted spiritualistic medium, is deemed incurably insane. He is in the asylum at Danvers, Mass.

THERE were about 100 applicants among navy officers to go on the search for De Long and the other missing men of the *Jeannette*.

A NUMBER of farmers living along the Salinas river are estimating the cost of pumping water with engines for irrigating purposes.

THE Carson Mint last month coined $198,000, as follows: Double eagles, $60,000; half eagles, $25,000; standard dollars, $113,000.

A CONTRACT has been awarded at Montreal for tunneling the St. Lawrence, at a cost of $3,500,000, the work to be completed within four years.

THE order of the Czar that only wood be burned in his palace is said to be owing to the fact that the Nihilists have smuggled dynamite in with the coal.

THE Sultan's interview with the American Minister, Gen. Wallace, was to gain information in respect to agriculture, and he has sent to America for specimens of the most improved agricultural implements.

MUTILATED, worn or otherwise uncurrent United States silver coins, of standard fineness, will be received at the Mint, in sums of three dollars and upwards, and paid for at the rate of one dollar an ounce.

THE *Kern County Californian* thinks that cattle and sheep-ranging has become so uncertain that the business of raising cattle and sheep will hereafter be done by farming, and the owners will grow the feed necessary for their sustenance.

WHEN Guiteau arrived at the jail he was at once taken to his cell and a guard placed over him. This precaution is always observed in the case of prisoners under sentence of death, and will be rigidly adhered to in Guiteau's case, both by night and by day.

A DELEGATION of 75 Dakota people is at Washington urging the admission of the southern half of the Territory into the Union as a State. They claim that there are 200,000 people in the area designed for Statehood, and that the voting population is 40,000.

COMMANDER CHEYNE seems sanguine of securing $40,000 on this side of the Atlantic toward the expense of reaching the North Pole by balloons. Sir Hugh Allan and other citizens of Montreal, offer to assist in obtaining a subsidy of $20,000 from the Dominion Government.

A LONDON dispatch says: The unsettled state of Europe would turn a vast amount of money into American securities, if the war of rates and other wars were suspended. Leading brokers say that they have many clients anxious to invest, but they are frightened by the serious fluctuations of the last few months.

SPEAKING of the toughness of the Pinte Indians, the Winnemucca *Silver State* says that the other night a squaw gave birth to a papoose in an open wickiup with the mercury at zero. Next day she was around, and the babe, wrapped in a rabbit-skin robe, is apparently as contented and comfortable as if born in a mansion.

ALL parties interested have decided that it is best to extend the Atlantic and Pacific road to San Francisco, to prevent the route from being taken by some other company. It is also understood that the Union Pacific shall extend its Utah system to a connection with the Atlantic and Pacific, receiving a pro rata percentage of through business.

THE orange crop of Florida, it is said, will be much shorter than was anticipated. The loss from splitting has been very heavy on the river of St. Johns, in some cases 75% and upwards. A large part of the crop has already been shipped, the fear of a freeze and the loss from splitting having induced owners to market their fruit as soon as possible.

THE Italian Consul, and, it is said, the French and other Consuls, are seriously considering the propriety of advising the abandonment of San Francisco as a port of call for the war ships of their respective nations, and of using Victoria in its place. They say that deserters are promptly arrested and returned by the authorities of Victoria, while the police of San Francisco will not look after them unless sure of what is considered an exorbitant reward.

IN pursuance of a dispatch received by Chas. Crocker from Leland Stanford and C. P. Huntington, who are now in New York, he has given out a contract for the immediate construction of the Atlantic & Pacific railroad from Mohave station, on the Southern Pacific railroad, situated at the head of Mohave desert, eastward to the Colorado river. Mohave station is exactly 100 miles from Los Angeles, and is now the depot for the Cerro Gordo mines, in Inyo county. It lies close to the 35th parallel, which the Atlantic & Pacific railroad will follow. The point at which the road shall cross the Colorado river is left open, to be designated and agreed upon by officers of both the Southern Pacific and the Atlantic & Pacific railroad companies.

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A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

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THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry O. Hanks, State Mineralogist.

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San Francisco Metal Market.

[WHOLESALE.
THURSDAY, February 9, 1881.

IRON.—		
American, Pig, soft, ton	— —	@30 00
Scotch, Pig, ton	25 50	@27 50
American White Pig, ton	— —	@— —
Oregon Pig, ton	— —	@29 00
Clipper Gap, No. 1	— —	@28 00
Clipper Gap, White	— —	@32 00
Clipper Gap Car Wheel	— —	@35 00
Refined Bar	4	@
Horse Shoes, keg	—	@ 5 50
Nail Rod	—	@ 7½
Norway, according to thickness	6½	@ 7½
STEEL.—		
English Cast, lb	13	@ 15
Black Diamond, ordinary sizes	—	@ 15
Drill	15	@ 16
Flat Bar	16	@ 18
COPPER.—		
Ingot	—	@ 22
Sheet	—	@ 20
Sheating, Tinned 14x18	—	@ 31
Nails	—	@ —
Bolts	—	@ 33
Old	—	@ —
Bar	—	@ 22
Cement, 100 fine	—	@ 15½
LEAD.—		
Pig	—	@ 5
Bar	—	@ 6
Pipe	—	@ 8
Sheet	—	@ 8
Shot, discount 10% on 500 Bags		
Drop, per bag	—	@ 2 10
Buck, "	—	@ 2 30
Chilled "	—	@ 2 50
TIN PLATES.—		
10x14 I O Charcoal	—	@ 7 50
10x14 I O Coke	6 15	@ 6 40
Banca Tin	—	@22 50
Australian	—	@23 50
I. C. Charcoal Roofing 14x20	—	@ 6 90
ZINC.—		
By the Cask	—	@ 9
Zinc, sheet 7x3 ft. 7 to 10 lb. less the cask	—	@ 10
NAILS.—		
Assorted Sizes	4 00	@ 4 15
QUICKSILVER.—		
By the flask	@37½	41
Flasks, new	— —	@ 1 25
Flasks, old	— —	@ 1 05

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OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, February 2, 1882.

At a meeting of the Board of Directors of the above named company, held this day, dividend No. 38, of seventy-five cents (75 cts.) per share, was declared, payable on Monday, February 13, 1882, at the office in this city, or at the Farmers' Loan and Trust Company, in New York.

WILLIAM WILLIS, Secretary.

Office—Room 29 Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

ASSESSMENT NOTICE.

Consolidated Pacific Mining Company.

ASSESSMENT, NO. 4.

Amount.....Forty Cents per share
Levied.....January 28, 1882
Delinquent.....March 3, 1882
Day of Sale.....March 27, 1882

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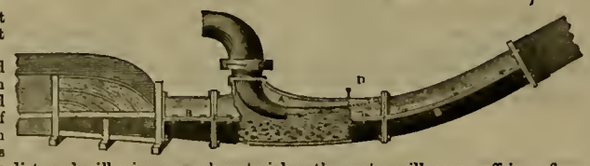

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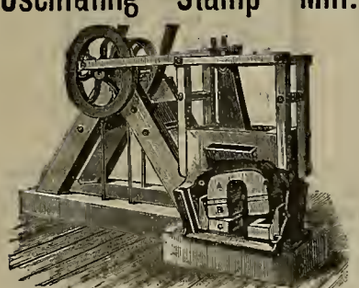

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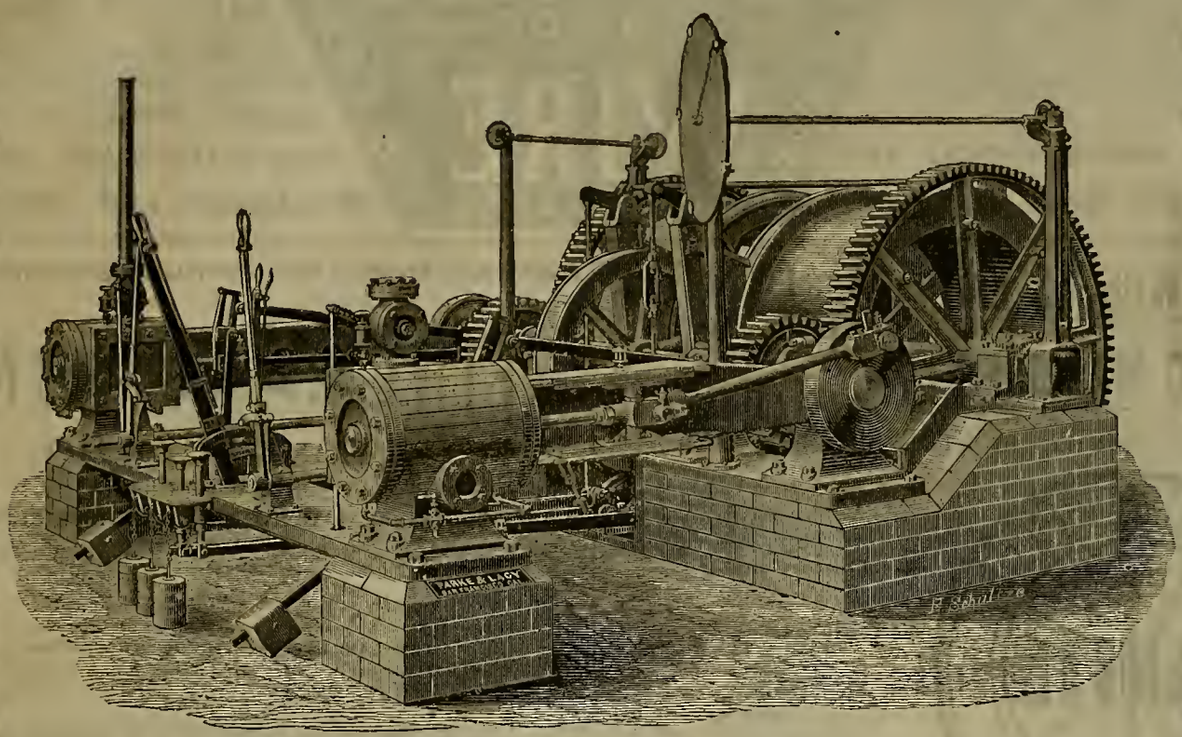

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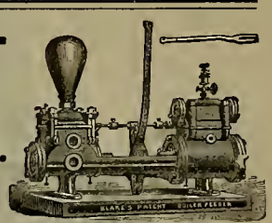

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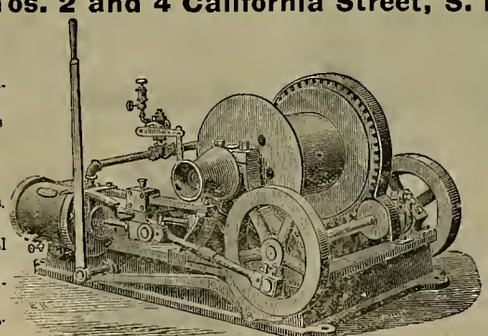

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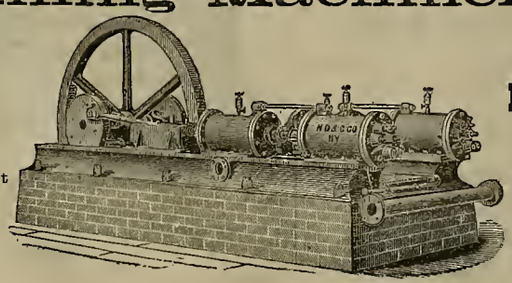

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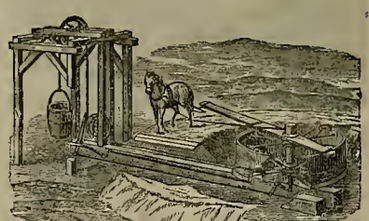

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CASH CAPITAL, fully paid up	$750,000 00
RE-INSURANCE RESERVE	306,260 52
RESERVE FOR UNADJUSTED LOSSES and all other Liabilities	55,675 77
NET SURPLUS	127,979 51
SURPLUS AS TO POLICY HOLDERS	877,979 51
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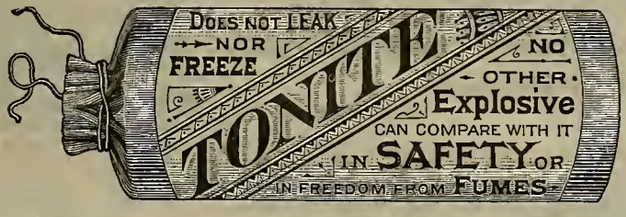

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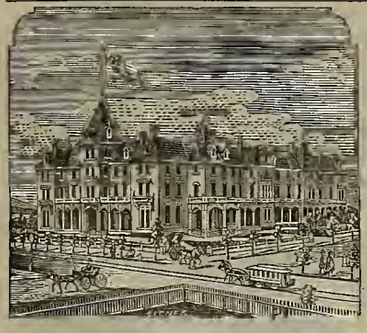

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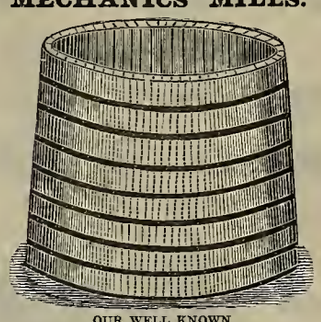

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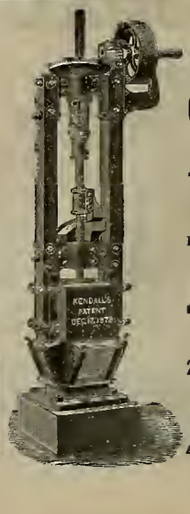

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SAN FRANCISCO, SATURDAY, FEBRUARY 18, 1882.

VOLUME XLIV Number 7.

Foundry Notes.

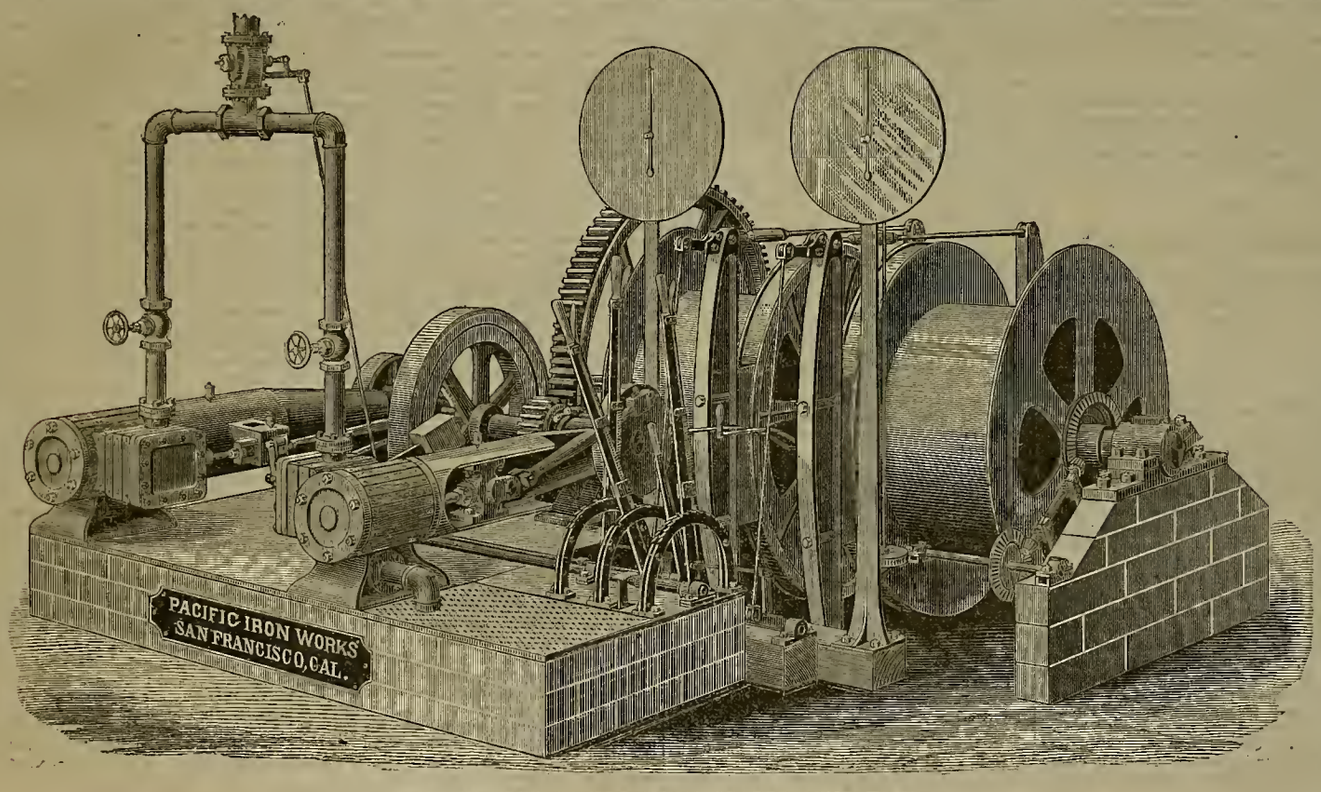
A New Mining Hoist.

Among machinery for working the mines of this coast, the hoisting engine occupies the most prominent position, because of the absolnte impossibility of reaching tho depths from which the precions metals are now mostly obtained hy any other mechanism. This machine has to deal, not only with the simple question of raising a given quantity of material from a certain level to the surface, but it has also to include in its requirements, economy, ease of working and handling, access, ability and durability of all working parts, and safety to the lives of men it transports into or out of the mines.

Among the machines of this class recently constrncted in this city, is a hoisting engine built by Messrs. Rankin, Brayton & Co., of the Pacific Iron Works, for a prominent mine in Montana, which combines within itself and in the shaft equipment all of the elements of a snccessful hoist.

It is, as the engraving shows, of the double engine, double drum geared style, with indicators attached to each drum, and each drum arranged to work indcpendently of the other, and of the engines, at the will of the engineer.

The engines are from new patterns designed expressly for the hard service of hoisting, having extra broad wearing surfaces and girder frames. The hoist is provided with post brakes to each drum and friction brake on engine shaft, the lever for operating which, together with those for operating the links and clutches and throttle valve, heing placed so as to be conveniently handled hy the engineer without changing his position. Thia hoist is calculated to raise a working load of one gross ton of ore, in addition to weight of cable, cage and car, from a depth of 1,200 ft. at a speed of 600 ft. per minute. The cages furnished with this hoist are entirely of wrought iron and steel of an improved pattern, with safety clntches and with every detail in their construotion carefnlly considered, to insure their strength, durability and safety, while at the same time redncing their weight to the lowest possible point. The enterprising firm who built this lot of machinery havo earned an enviahle reputation for the high character of their productions. This is only one of the several forms of hoists made by them, some of which wo have previously described.



NEW PATTERN DOUBLE DRUM GEARED MINE HOIST.

Barker District, Montana.—Mr. J. M. Gray writes to us as follows from Gold Run, Barker district, Montana: It may be of interest to you and yonr many readers to hear something from this comparatively new mining region in Meagher county, Montana. The Clendenin amelter has just concluded its first and a very successful run. The difficulties of starting a new smelter upon ores of a new district have heen fully met and overcome hy Supt. Foss, who fully understands his business. There are a number of very promising mines in the district upon which work is being pushed, but 70 ft. is the deepest working in the district. This is on the Barker mine; it makes a fine showing at that depth.

Copper Smelting.—Speaking of the Ludwig & Carter copper mine, the Aurora, Nevada, *Herald* says: The smelter is now turning out a little over 100 lbs. of copper every half hour, which, for its size, is considered pretty good work. A large iron water tank has arrived and will take the place of the smaller one heretofore used. Mr. Jones, the smelter, has proven his water-jacket invention a success. It does away with the use of fire-bricks and obviates the necessity of stoppages every few days to replace them. Last week a carload of copper bullion was shipped to San Francisco. Copper having advanced 23 cents, the owners of the Ludwig & Carter ought to realize a handsome fortune from their mine.

Two locomotives and 30 freight cars were demolished on the S. P. R. R. on Snnday, on the east slope of Gorgonio Pass.

Attachment for Furnaces.

Mortimer F. Wood, of this city, has just patented, through the Mining and Scientific Press Patont Agency, an improved attachment for furnaces, the object of which is to utilize the exhaust steam to produce more perfect combustion, and the muffling of the sound of the exhaust, thus doing away with smoke and noise. The invention consists of a pipe attached to the exhanst, and having within it, at the beginning, a series of flanges or blades, so set as to canse the steam to take a winding or tortnons course. The pipe is carried around the boiler on the ontside, and returned into the fire-box just above the grate bars, within the fire, and then proceeds around three sides of the fire-box, and up through the fire to the level of the live coals, across which it extends. It is here provided with apertures, from which the gas is directed upon the coals and causes more perfect combustion.

In ordinary cases exhaust steam is puffed off with considerable noise and is wasted. In this invention it enters a pipe and its rapid and forcible progress is at once checked by blades or flanges extending from the sides of said pipe alternately. There it has to pass in a winding or tortuous course, so that by the time it is conducted through the full extent of the pipes and finds an opening in the fire-box its force and power are broken, and it is ejected noiselessly and without much draft, thereby adding to the combustion and producing an economy in fuel. The blades or flanges in the pipe therefore act as mufflers, and, hy breaking the force of the steam, cause it to enter the fire-box with but slight force. A jet of steam would tend to extinguish the fuel, and, when superheated, if blown in with force would cause so great a draft as to increase combustion too much; but by breaking its force, and at the same time heating it, combustion is more perfect without heing too greatly accelerated. When the steam enters the fire-box while yet in the pipe, it is conducted in the midst of the fire for some distance, ao that when it finds its way ont it is in a condition to feed the fire. There is no moisture left in it, and its hydrogen, being directed upon the live coals, produces a more perfect combustion, and thus prevents smoke.

This device is designed as an attachment for any furnace, and the inventor claims it will effect a considerable saving of fuel. Although it is here described as utilizing exhaust steam, it is obvious that prime steam could be used, but of course with less economy.

New Departure.—The Geographical Society of the Pacific, instead of having a regnlar meeting this week, had a *conversazione*. The members of the Geographical Society of the Pacific folded up the society charts and engaged in a social *conversazione*. There was an unusually large attendance, many bringing their wives and daughters. C. Mitchell Grant, the Secretary, acted as host, and introduced several new features hitherto unknown at Geographical Society meetings; namely, lemonade, claret punch, cakes and tea. The large and comfortable rooms occupied hy the society were kept filled hy a pleased and interested gathering of people until later than the usual time for the meetings to adjourn.

The *Silver State* of Thursday says: S. Wenban has shipped from Beowawe 20 bars of bullion, valued at $24,708.69. This bullion was from Cortez district, where he has a mill and has been engaged in mining for years. Chinese labor is said to be exclusively employed in the mine.

J. W. Curtis, who came in from Oro Blanco district yesterday, says the Tucson *Citizen* of Feb. 11th, brought with him abont $3,000 in bullion, the result of a run on the Blue Wing ore in which some new developments have of late been made.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Wood River, Idaho.

Editors Press:—The Senate mine of this place is about to be organized into a stock company, preparatory to recommencing active developments in the spring. This mine was bought originally for Messrs. Woolworth, of Ohio, and Mr. More, of San Francisco, from Messrs. King, Gerard & Co., for $1,600, and a certificate for 2,000 shares of stock as soon as the company should be organized; amount of stock to be issued not to exceed 100,000 shares.

The par value of the stock is not yet fixed, but we presume that it will not be less than $1 per share; and as they have a smelter, with 50,000 bushels of coal on hand, and on a property which, although comparatively undeveloped, is of undoubted value, the stock cannot but rapidly appreciate in value.

There are many really good mines around Galena, owned by men with small capital, which, for want of reduction works, have hitherto remained undeveloped. Most of these will, however, be worked in the spring, if the different smelters to be erected will but work the ore at a reasonable figure. Among these mines which, by proper development, might become very valuable properties, are the Tennessee, Portland and Tenderfoot, owned by Messrs. King & Gerard. The group is situated near the Red Cloud, belonging to the Senate Mining Co., and each possesses a well-defined mineral-bearing ledge; that of the Tennessee is about 2½ ft. in width and traceable on the surface its whole length of 1,500 ft. Besides these there is the Independence, Leviathan, and a dozen others equally as good, which only await capital to develop into paying mines. Of course, these ledges are not solid bodies of paying ore on the surface, but is a mixed homogenous mass containing galena ore in more or less quantities, which, as it goes down, is highly probable will merge into a solid vein of mineral.

The winter has not been near so rigorous as we were led to expect, the snow not being over 2½ ft. deep at Galena, the highest town on Wood River. Regular stage communication is kept up between Saw Tooth and the outer world, despite the many prognostications to the contrary. J. E. C.

Galena, Jan. 24, 1882.

Mineral Basin, Mariposa County.

Editors Press:—Seeing in a late number of the Press that you wish to get items from isolated camps, I feel happy to send you a little about this once prosperous and rich camp of placers. It was a common thing for men to make as much as $20 per day to the hand in ground sluicing. Wm. Lindsey tells me that he and P. Hope have picked up lumps of gold weighing over $50, in the chemisel roots; and Mr. Hope told me that he has picked up on the surface lumps weighing $40. W. Wheeler and Abercrombe have made in one day's rocking $2,000. That morning W. says to his partner, "We will do well to-day; I dreamed we got a piece like a cow's udder with the teats on it." In half an hour afterwards Wheeler picked up the identical piece, weighing $700. In a few moments his partner picked up a chispa of $300, and various other lumps that day. McHenry Van Winkle told me he saw a piece got as large as a man's doubled fist, on the lee side of my pocket ledge, with a little of my quartz stuck on it. He offered me a price for half. I did not accept. I have got at various times lumps that weighed six ounces. This a good place for a man with some capital, to invest in quartz prospecting or he could buy us all out here for a nominal sum—a few hundred would buy two veins from me, that are probably worth many thousands; its the same with my neighbors. Antone Rihn and J. P. Lawler have rich quartz here; they call it the Yosemite mine. Everyone wants to sell; we are only able to do assessments. My Ben Lomond lode has $50 rock in eight; crops out one-half mile, one foot wide. Would sell for $800, in order to get money to take out a patent for a valuable invention. M. M. Murray.

Coulterville, Mariposa Co.

Farmers as Miners in Siskiyou County.

Editors Press:—We want our mines developed, and it will take men that understand the business better than we do to do the work. We find by experience that it takes more money to open a quartz mine than we are able to furnish and keep the farm going. A number of farmers in Scott valley have located gold quartz claims near the valley, and have done assessment work on them for several years, with no other motive than to dispose of them the first opportunity that might offer itself, in order to create a market for the produce that we raise on our farms. If capitalists will investigate Siskiyou county, I think they can be suited either in gold, silver or cinnabar mines. The field is large and capital is needed. Take the west side of the valley, and the ledges carry gold, while on the east side they carry gold, silver and copper. H. C. Cory.

Ætna Mills, Siskiyou county, Cal., Feb. 4th.

Lake Mining District.

Editors Press:—I herewith send you a few lines regarding an old abandoned mining camp, Lake Mining district, Mono county, Cal., and the probability of its coming to life again, soon. You will probably remember, two years ago, when they struck a rich pocket in the Mammoth mine, which sent the stock up to $16, but soon dropped again as the pay was deposited only in bunches. I have just returned from Lake district to inspect a mine called the Lishon, situated about two miles south of the old Mammoth mine. I found a ledge cropping out, which could be traced for several hundred feet, besides three stringers from 18 inches to 12 inches, running parallel with the main ledge, which, no doubt, will come in the main ledge deeper. The mine has been worked by three tunnels, 60, 125 and 160 ft. long respectively, which all show in rich ore, the latter tapping the ledge at a depth of about 300 ft. There are also two shafts, one about 100 ft. deep. Both are in rich ore in which one can see the gold with the naked eye. The owners worked some of the ore last summer, and took out about $3,000 with an arastra. The average width of the ledge is two feet, but in some places it widens to four. There is a good wagon road built up to the mine, and the owners have spent about $8,000 on their property. The present owners are G. Troy, Eddy & Sims. C. Rand.

Bodie, Feb. 4, 1882.

Demand for Copper.

Six months ago ingot copper sold in the New York market at 13¾c per pound. Now it sells for 20½c per pound. Perhaps it may be useful to at least attempt to find some good reason for this sudden and large advance in prices, and also to take a cursory glance at the copper fields of the world, with a view to discover the sources from which a supply of this valuable metal will be drawn in the future. It will be well to also furnish as exact a statement of the present production of metallic copper throughout the globe, as our available sources of information will afford. And lastly, to mention more especially the resources of the United States, and the probability of our being able to furnish a supply for home use, as also a supply for the balance of the world, should there be a demand and a market for it.

There can be but one cause assigned for the present rapid advance in the price of metallic copper, namely, the intense activity in electrical science, and its rapid practical application to man's uses and wants. This practical use of electricity was doubtless furthered more by Dr. Franklin than by any other scientist, at least, of his day. Previous to his time it was more of a study or experiment, known to but a few scholars and students of nature's laws. And now, in our day, it is reasonable to believe that to Edison, another countryman of ours, the world is and will be more indebted for giving form, force and direction to this wonderful and powerful agent, stored in inexhaustible supply in earth's atmosphere for man's use, than to any other.

With the invention of the great dynamo-motor machines of our day, it was found possible to supersede gas with electricity for lighting purposes. Already our streets, great warehouses, mines, factories and public halls, etc., are lighted with it. Its use in private dwellings will shortly follow. It is not unlikely that at some future day our cars will be drawn, and steamships propelled, by electrical instead of steam power. Perhaps, when coal gets scarcer and dearer, it will furnish heat for our dwellings.—*New York Stockholder.*

Eureka Tunnel.—A *Sentinel* reporter visited the Eureka tunnel yesterday in company with the Secretary, Mr. J. E. Butler. The mine seems to be well worked, developments being pushed ahead by a force of 23 men. The winze is down 82 ft. and looks well. Near the bottom of the winze streaks of ore rich in black metal occur. Three specimens of this formation, each assaying upwards of $2,000 to the ton, our reporter brought in with him. Mr. Mette, the foreman of the mine, is active and intelligent in advancing the work. Recent shipments of ore to the Eureka Con. works for reduction have paid handsomely. In fact one cannot go through the tunnel and examine the drifts, winzes and upraises and the natural cavities and fissures, without being impressed with the belief that there are great chimneys of ore almost everywhere in the mountain. The prospect seems good at all points. The indications are so clear that the least experienced miner could not miss his way towards uncovering the thousand and one bonanzas in Prospect mountain that give signs of their neighborhood everywhere. This is all said without exaggeration in regard to the mine. If the title to it were clear, and if there were no apprehension of trouble on this score for the future, the stock would appreciate rapidly.—*Sentinel.*

We feel happy to state, and suppose that many will be glad to learn, that the affairs of the Lincoln Silver Mining company, of El Dorado canyon, will soon be straightened out, and the company will resume work on their mines on a sound basis. Messrs. Huntington, Baker and another gentleman, all of Minneapolis, Minnesota, have agreed to put up $30,000 for one-half of the capital stock of the corporation.—*Pioche Record.*

Cænurus of the Hare.

[Read before the California Academy of Sciences by Dr. Mary K. Curran.]

Anyone who has noticed tha wild hare (*Lepus Californicus*) which is brought in such quantities to our markets from November to March must have occasionally observed upon their loins and thighs swellings of considerable magnitude. Many are killed in which these tumors have developed to the size of an orange, though probably none so greatly disfigured are ever found in the markets.

These swellings, which are well known to hunters and market men as "water blisters" or "water boils," are found in a very considerable proportion of tha hares, but, so far as I have observed, do not occur in the smaller species which are popularly called rabbits. Although they are so frequently seen, I have never met with anyone who had the slightest suspicion of their true nature—for these innocent-looking "blisters" are tape-worms in the larva stage, waiting patiently for their final transformation.

Tape-worms are exceedingly common, most animals harboring one or more, either in the perfect or the larva state, but they are rare in reptiles. They are true parasites, living entirely at the expense of their host, and repaying him in too many instances with disease and death. Their life history is now tolerably well known; those which belong properly to the carnivora, pass their larva stage in the flesh of some herbivorous animal which is the natural prey of its future host.

Tape-worms, in their perfect form, are rather inconvenient than dangerous guests. They can be dislodged with comparative facility; but unhappily this is not true of the larvæ.

Those which may be said to belong to man, as a carnivorous animal, are *Tænia solium*, which comes to us from measly pork, and *Tænia medio-canellata*, which is derived from beef infested with vesicular larvæ, very similar in appearance to the "measle." Abyssinia is the chosen home of this tape-worm. The people of that country eat raw beef which is still warm and quivering. Small wonder then that the whole population is infested with this parasite; but as most evils have their attendant good, so have their efforts to obtain relief given to us one of our best remedies—kousso.

Tænia echinococcus, which, in the perfect form, inhabits the dog, is found in man only in the larva state, producing what was formerly called "hydatid disease," which is always dangerous, and frequently fatal. It is quite rare in this country, but in Iceland, where the dogs live huddled together in huts with their masters, and cleanliness is a forgotten art, it prevails so extensively that one in seven of the population is said to be affected with it.

Among the lower animals a notable example of the ravages caused by tæniæ is found in the disease called "gid" in sheep, produced by a larva which selects the brain as a resting place. Van Beneden, in speaking of this parasite, says: "The introduction of gid into a country is a calamity. Every animal attacked is doomed, and the only remedy is to destroy by fire the head of every one which dies of the disease." This dreaded parasite is *Tænia Cœnurus*, and in its perfect form is harbored by the dog and wolf.

The subject of this paper is also a *Cœnurus*, a name given to those *Tæniæ*, which in tha larva state, develop many heads from a single vesicle by a process of budding. It has never been described from the hare so far as I know, but Mr. C. B. Rose, of Norfolk, England, published as long ago as 1833, an account of a cœnurus found in the rabbit of the warrens, (*Lepus Cuniculus*), which may be the same. Further investigations, and especially comparison of the perfect tape-worms are necessary to settle this question.

The more detailed description which follows, has been carefully made, and as the material is abundant, can be readily verified by anyone accustomed to the use of a microscope.

On removing the skin from a hare affected with cœnurus, one or more swellings looking like bladders buried in the flesh, may be seen, ordinarily upon the loins or thighs, though they may be found in any part of the body. If the capsule of connective and muscular tissue which encloses the cœnurus be now carefully opened, a quantity of clear fluid and a bladdery vesicle escape. This vesicle is also filled with fluid, and has attached to its outer surface many smaller vesicles, and a great number, often many hundred papillæ, which, when fresh, are seen to be actively contracting. These papillæ, milk-white in color and attached by slender pedicels to the vesicle, are about two lines in length and one in breadth at the widest part, which contains the head turned inward like the partly inverted finger of a glove. The body displays a number of transverse lines, indications of the future joints of the worm.

If one of these papillæ be carefully detached and placed under a microscope, moderate pressure upon the covering-glass will cause the enclosed head to protrude and bring to view its four sucking disks and double crown of pointed hooks, 14 or 15 in each row. The hooks of the inner row are double the size of the outer; but being attached half their length nearer the center, the points of all fall in the same circle. Just beneath the dermis are seen an immense number of round or oval bodies of a concentric structure, which effervesce strongly on the addition of sulphuric acid. These are the so-called calcareous corpuscles, and are supposed to act as a kind of external skeleton.

The head and neck of this cœnurus are much smaller in proportion to the body than are those of the cœnurus of the sheep, as it is shown in the drawings to which I have had access.

The natural hosts of the cœnurus of the hare are the dog and the wolf. Our wild dog, the coyote, will serve to illustrate the journey of its life. A hare badly infested with cœnurus, becomes swollen and deformed, and as the loins and thighs are attacked by preference, his powers of locomotion are seriously impaired. In this condition he falls an easy prey to his hereditary foe.

The coyote swallows not only the hare, but its 10,000 contained larvæ, a circumstance which would undoubtedly give his victim a feeling of malicious joy, if he were in a condition to know anything at all about it. The larvæ are set free in the stomach of the coyote by the digestion of the vesicle, and a certain proportion succeed in attaching themselves, by their hooks and suckers, to the walls of the small intestine, fortunately only a very small proportion, for their way is beset with dangers, and their extraordinary fecundity is calculated in proportion to their chances of safety.

The tape-worm is a colony of hermaphrodites, each joint of which is a sexually complete animal, male and female containing thousands of eggs. It reaches maturity in about six weeks, after which period the lower joints, and numerous free eggs are discharged at each evacuation, and deposited upon the ground, weeds or grass.

The eggs are so small as to be quite invisible to the unaided eye, and being furnished with a very thick envelope, have considerable tenacity of life. The hare swallows these eggs, either by feeding upon the grass and weeds, or by drinking from pools of water into which they have been washed. In the stomach the thick envelope is digested, the contained embryo is set free and immediately starts for its predestined resting place. This microscopic embryo is furnished with six hooklets, by means of which it penetrates the walls of the intestine and imbeds itself in the muscular tissue. Here it ceases to move, its booklets fall, and it slowly develops into the polycephalous vesicle first described.

This paper has not been written to discourage the use of the hare as an article of food; on the contrary, the aim has been to point out the remedy for an evil, which is undoubtedly increasing. So far as is known this tænia does not develop in man, and if it were capable of doing so, the thorough cooking to which it is subjected would be a strong safeguard, underdone bare not being so popular a dish as roast beef rare, or ham warmed through.

From what has been said of the life history of the cœnurus, it is evident that if every affected hare were well boiled, or burned, the disease would become much less frequent. At present it is disseminated in such a manner as would almost lead one to suppose that the breeding of this parasite is an object greatly to be desired. These affected hares are sold every day in the market, and in face of the general ignorance of the nature of the tumors, no blame can be attached to the vendors. The health of the animal seems unaffected by the parasite he harbors, and in many cases they are so deeply buried as only to be discovered by incision.

These hares are either thrown away by the purchaser or are used for food after the tumors have been removed. In either case, they are eaten by dogs, which become infested in the same manner as the coyote, and like him convey infection to the hare again.

In the country this method of disposing of their bodies is still more objectionable, for they are found and eaten by various wild animals, and although the dog and wolf are the natural hosts of this cœnurus, it may have others, possibly the lynx and the fox.

In this way the vicious circle of disease is continually widening, and unless a change is made, we may expect, at no distant day, to find the hare, as an article of food, banished from our markets.

The burro, a kind of ass, becomes very much attached to the miners who use them on their prospecting tours, when they are kindly treated. A young man who had been in the habit of crossing the Rocky mountains with his beasts every spring, after wintering near Del Norte, had been very kind to the burros. He died this summer, and, after waiting four weeks for his reappearance, they escaped from their pasture and set out to search for him at winter quarters, 130 miles distant. They apparently traveled only in by-ways and by night, or they would have been captured by teamsters. Four weeks after escaping they waited one morning at the threshold of the ranch of their departed owner, 10 miles from Del Norte, where they alternately peered into the window to see if their master was there. After they had waited a long time at the door a Mexican living in the vicinity, who recognized them, penned them up in his pasture land. They broke away on the first night; their master was not there. Another neighbor put them into his enclosure, but they did not stay there either, and the second morning found them on the other side of the Rio Grande, where they had their old accustomed pasturing.

Joseph Ortiz, in Lower California, reports the discovery of rich placer mining in the region of San Elmo. It is found in the ravines, and can be washed by sluices.

MECHANICAL PROGRESS.

Use and Abuse of Files.

It is a wondsr that ths file, rather than the bummsr, has not besn recognized as tho sign of ths mannfnctnring industry. Its rangs, powsrs and nsefulness ars far beyond thoss of the hnmmer, and it can assume tho functions and psrform the work of n nnmber of auxiliary tools to which the hammer holds no nnalogy.

Whatever cnnnot be done hy tbe sst and power-drivsn machines in ths shops where the mstals are worked, is sent to the fils. The file rednces protnberances, smooths roughnesses, changes inolinations of surfaces, cuts scores, forms lsvels between parallsl drill holes, prspares snrfacss for ths scrapsr, svsns the roughnsss and inequalities of lathe work, cleans out ths suggestion of ths rih-liko projections of ths plansr, shapes the tool wbsre tbs most dclicats grinding apparatns fails, makss n hettsr finisb to the sye than nny scraping or stoning, is a saw at times, may be nsed as a chisel, takes the place of a plane, smooths ths roughnssess of oastings and forgings, reduces thsir proportions to sizs, and finishes thsm to fit. Except for drilling holes through solid mstal ths fils cnn take ths plnce of any tool used for any othsr purpose on the metals.

In England, Scotland nnd Wales, the filer is a mnn hy-himself; he has little to do with the laths man nr ths floor man. He is ths princs among ths machinists. Hers we think all ths work of the machinist may he done hy one man, and the lathe man, planer man, floor man, and viss man may he comprised in ons. But this gensral *cnsemble* is gstting out of dats here.

* * * Thsre is more nsed of attention in our sbops to ths uses and the nsefulness of ths fils. It is ths most nhused tool that evsr was employed, and it sssms to bs ths most nsglected tool. The writer ventnres ths assertion that, in hroken or whole discarded files lies a portion of the buried stock of defnnct companies which could not make hotb ends meet, and ths neglsct of the fils interest is ons of the reasons why manufactnring stock "don't pay." To he sure, a single file, howevsr fine its cut or large its cost, wonld not bankrupt a company nor movs a mark in the dividsnd list hy its loss; hut files nre in continual nse; they are callsd on for svsry emsrgency, and thsy are doing duty in ths hands of almost every employss of a mstal-working estahlishment. The snpply of files is one of ths "large" hills of every machine huilding estahlishment in ths conntry.

How to nss thess tools ought to be a fixed lins of instruction in all shops. It is an ontrsge on common mschanical taste to go through ons of ths heat of onr shops and see how this tool is misnsed, ahnsed and thrown aside half used. It is a mistake in this country to try to make a good plansr, a good laths man and a good filer out of one man. It has never succeaded—unlsss in some remarkabls instances—and it is not generally practicahle.

The nnmher of shapes of the file, demanded in the ordinary hnsinss of machine hnilding and tool making, is enough to appal ths heginner and snfficient to employ the shop life of the jonrneyman in thsir nse. At the great exhibition in Philadslphia in 1876, thsre were showhoards of file maksrs from England, Belginm, Fraocs, Gsrmany, and homs, which showsd a collection that wonld almost make a mussum. And yet nons of thess specimsns were gotten np for show merely, hnt wsre *bona-fide* specimens of tools called for and made in responss to a dsmand. Looking at thess, it would he folly to clnim a mastery of the art of filing. But with the diminished nnmhsr of shapes and sizss we uss in our general machins shops, the workman is a rsmarkahle one who can handle them jndiciously and economically.

The waste in files in our homs shops is enormous. There are some, as the hastard files, which lose their value with the sharpness of their teeth; hut all the fine-cut files have as many lives as the traditional cat. The writer knows of instances where line-finish files have "held their own" for 11 yeare constent (occasional) nse. A better fioish can he put on a surface of cast or wrought iron hy an entirely worn-out file than hy the linest emery—if the workman knowe how to use the file.—*"Cold Chisel," in Boston Journal of Commerce.*

A colorless cement for joining sheets of mica is prepared as follows: Clear gelatine is softened hy soaking it in a little cold water, and the excess of water is pressed out hy gently squeezing it in a cloth. It is then heated over a water hath until it hsgine to melt, and just enough hot-proof epirit (not in excess) stirred in to make it fluid. To each pint of this solution is gradually added, while stirring, ¼ ounce of sal-ammoniac and 1½ ounces of gnm mastic previously dissolvsd in 4 ounces of rectified spirit. It must ho warmed to liqnefy it for use snd kept in stoppered hottlee when not required. This cement, when properly prepared, resists cold water.

Masks of Mica.—A German manufacturer has succeeeded in prodncing serviceable face masks of mica, for the protection of metal and glass meltere, stone-masons and other workmen exposed to heat, dust and noxious vapors. These masks allow the eyes to he turned in any direction, and there is epace enough for epectacles, in case tbe eyesigbt is defective.

Mechanical Education.—Thsre is nothing particularly suggestive nf art in the appearancs of an ordinary crowbar, says the *American Machinist*, hnt as tbsy ars prodnced thsy represent the work of an sducated man. Such n tool—a tapsring bar of stesl—is, hesides the point, mado np of three distinct forms, beginning with a squsre, continuing witb an octagon, and concluding with a round ssction. Looking at a pils of n hundrsd or more as they come from ths hammer, it is a difficult matter to dsteot diffsrence enongh to dstsct one from nnnther. This wonld all be simple snongh if thsy wsrs forged hy tho aid of diss, hnt the fnct is that thsir correctness nf shape dspsnds sntirsly on the skill of ths individnal who presides at the hammsr. Thsre are a thousand wnys to make them unlike, nnd only one to make them alike; yet each of the three forms is msrged into the snccesding one, with a corrsctness thnt would do oredit to a draftsman, and the sizes are kspt so nearly psrfect ss to require close measoring to find whero one diffsrs from anothsr. Of conrse it is easy snongh to sss how such things may he dons if plenty of time is nllowed; hnt psrhsps the most wonderful thing about the forging of this simple tool is tbs fact that it is all done in from two nnd a half to four minntes. Any man with no guide hut his eys, who can do snch work as this, and in snoh time as this, does it hy virtue of a high education of a practical and valnable kind.

A Flexible Shaft Coupling.—Mr. Arthur Verity, of Bramley, Leeds, England, has patented an invention known as "Verity's flsxihls shaft coupling," consisting of nn arrangsment whereby strained or hent shafting, or shafts at an angle to each other, may he oonpled togethsr, and rotary motion transmittsd from ons to the other. The two snds of the shafts to hs connected are recessed or cnpped to recsivs a hall which is insarted hstween them. This hall retains ths axis of the end of each shaft an equal distance from its csnter, without rstarding or intsrfering with its motion. In ordsr to retsin the ends of the shafts in contact with the hall, and at ths ssme time to allow of any eccentric or irregular movemsnt, hossed disks or conpling plates, corresponding with each other, are fitted on thsir respective shaft-snds. These plates have projecting piecss, or lugs, which are gesred togsther in a similar manner to a toothed clntch. The outer snd of the convex conpling plate is providsd with a concave plats, this being made concentric with the hall. Ths plates are held togethsr hy holts in combination with the concave plate, at the sams time admitting of any irregular movement of the shafts cansed hy hsing strained, hent, or placsd at an angle.

Strength of Glass.—Traulionie gives the tsnsils strength of glass at from 2,500 to 9,000 lbs. per sqnare inch, according to kind; crushing strength, 6,000 to 10,000 lbs. psr square inch; transversely, hy his own trials, Millvills (N. J.) flooring glass, one inch sqnare, and ons foot hetween the end supports, hrsaks undsr a csrtain load of ahont 170 lbs., consequently it is considerably stronger than granits, except as regards crnshing, in which the two are about eqnal. It is suggssted that glass will shortly he nssd for many purposes whers other and mncb inferior matsrials are still exclnsivsly employed. Glass may he ussd as watsr conduits to hstter advantags than cast iron or tsrra cotta, as it is impervious to moisture and proof against corrosion or ohemical action. It is already considerably in nse for flooring, aod it has latsly heen successfully expsrimented with for railway sleepsrs undsr sxceptionally ssvere conditions.

Durable Molds for Casting. — Doctor Schlaegel, of Hoyerwerdaa, Germany, mannfactnres molds for casting from clay and hrown coal. Pure clay is ground very fine and kept dry for nss. The coal is also ground to a degree which is variahle according to ths kind of casting warranted. The clay and the coal are well mixed together, and when the clay is of good quality, a mixtnre of the two in eqnal proportions will do for most purposes. Cnamotte meal may he added to make the mold harder, hut is not ahsolutely necessary. The mixture is worked, aftsr the addition of water, into a stiff mass, which is used for the molde, the latter heing made in a manner similar to sand molds, and dried slowly. When dry they are washed with a dilute solution of solnhle glass and dried again, tbie operation heing repeated, three or fonr times. When perfectly dry, the mold is hurned to give it a glossy appearance.

The piston speed of engines has, until recently, heen practically the same ever eince the engine came into general use. The tendency of late years, however, has heen to increase speed. Formerly the average speed of piston was ahout 300 ft.; it is now prohahly not less than 450 ft. Of course the speeds are generally suited to the work. Some run up to 700 ft. and even more per minute.

Carbonic acid, so necessary for the production of vegetation, yet only forme a thousandth part of the atmosphere. It is calcnlated, however, that when taken to the full altitude of the atmosphere the lattsr contains the enormous total of 3,400,000,000,000 tons of carhonic acid. This amounts to ahout 28 tons over every acre of the earth'e snrface.

A Steel Bar held in the direction of a magnetic needle, and strnck several hlowe witb a hammer, will become magnetized.

SCIENTIFIC PROGRESS.

Pre-historic Tides.

Prof. Ball, of England, in n recsnt lscture, spoks as follows:

At pressnt the moon is 240,000 miles away, hnt there was n time when ths moon was only one-sixth pnrt of this, or say 40,000 miles away. That time must have corresponded to some geological epoch. It may hnvs heen earlisr than the tims whsn Eozoon livsd. It is more liksly to hnve hesn later. I wnnt to point ont that when the moon was only 40,000 milss away, we had in it a geological engine of transcsndent powsr. If ths pressnt tidss bo threo ft., and if ths early tidss he 216 times their pressnt amount, thsn it is plain that the nncisnt tides must have besn 648 ft.

There can be no doubt that in ancient times tidss of this amount, and sven tidss vsry mucb largsr, mnst have occnrred. I ask the geologists to taks ncconnt of thsse facts, and to considsr ths sffect—a tidal rise and fall of 648 ft. twice evsry day. Dwsll for ons moment on the suhlims spsctacls of a tide 648 ft. high, and see what an agent it would he for the performance of gsological work! We are now standing, I supposs, soms 500 ft. above the levsl of the sea. The sea is a good msny miles from Birmingham, yst if ths rise and fall at ths coasts were 648 ft., Birmingham might he as grsat a ssaport as Liverpool. Thres-quarters tide would bring the ssa into the streets of Birmingbam. At high tide there wonld he ahont 150 ft. of hlue water ovsr our heads. Evsry honss would hs covered, and ths tops of a fsw chimnsys wonld alone indicats the site of the town.

In a few honrs more the wbols of this vnst flood would have retrsated. Not only wonld it lsave England high and dry, hut prohahly tbe Straits of Dovsr would bs drained, and perhaps sven Ireland would in a litsral sense become a membsr of ths United Kingdom. A few hours pass, and the whole of England is again innndated, hut only again to hs ahandoned.

Thsss mighty tides ars the gift which astronomsrs havs now made to ths working machinery of ths gsologist. They constitnts an sngine of terrific powsr to aid in ths great work of gsology. What would ths puny sfforts of water in othsr ways accomplish when compared with these majsstic tidss and tbe great cnrrents thsy produos?

In the grest primeval tidss will probably bs found the sxplsnation of what has long hssn a rsproach to gsology. The early palæozoic rocks form n stupendous mass of ocssn-mads beds, which, according to Prof. Williamson, ars 20 milss thick np to the top of the silnrian heds. It has long heen a difficulty to conceive how snch a gigantic quantity of material conld have heen ground np and depositsd at the hottom of ths ssa. The geologists ssid: "The rivers and othsr agents of the present day will do it if you givs them time enough." But, nnfortunatsly, the mathematicians and the natural philosophers would not givs them time snough, and thsy ordered ths geologists to "hurry np thsir phsnomsna." The mathsmaticians had othsr rsasons for helieving that the earth could not have heen so old as the geologists demanded. Now, however, the mathematicians havs discovered the new and stupendous tidal grinding engins. With this powsrfnl aid the geologists can get through their work in a rsasonahle psrfod of time, and the geologists and the mathematicians may he reconciled.

How Comets Affect the Earth.

Prof. Lewis Boss, in his recent prizs essay on comets, says: "The influence of comets upon ths earth, is in all prohability quite insignificant. They may, liks the sun, affect the sarth's magnetic condition, and thus to some extent, possihly, its meteorology. No such effect has ever heen perosived. In epite of eome chance coincidences hetwesn the apparitions of great comets and remarkable public events, no well-informed psrson now believes that there is any real connection hetween them. By a liheral and credulous interpretation of any frequently occnrring celestial phenomenon, similar coincidences could he shown. When a comet is converted into meteoric hodies, which impinge npon the earth'e atmosphere, there ie some direct though prohahly minnte effect. Some have thonght that a sensihle portion of the heat which the earth receives is generated in thie way; hut the weight of scientific opinion seeme to he against that hypothesis. The impact of meteors npon our atmosphere mnst add some matter to it, and this is prohahly in the form of dust. This may he the origin of the so-called cosmic dust, which has been collected at sea in recent times. The finer particles of it may have some influence on cloud formations and other msteorological phenomena; but all this is merely conjecture. A more remote effect may he sought in the possihle fall of meteors and comets npon the surface of the sun.

Owing to his vast hulk, the sun would attract an immense nnmher of these bodies; hnt it is qnite certain that their effsct npon the sun'e heat is insignificant. It is now generally admitted that we muet look for the origin of the eun'e heat in a constant, though to ns imperceptihle, ehrinkage of hie vast hulk. Some connection between the freqnency of eun-spots and comets bas been rather vaguely snspected. Were ths search for comsts systematically pnrsued witb eqnal pssistence for a long period, ws might have soms data for ths formation of n sonnd opinion. Yst it would still be an open qnsstion, whether ths comsts canse ths spots, or whsthsr grsater activity of ths snn tends in soms way to render comsts hrighter, so that more will bs visihls—with prohability in favor of the latter supposition. Finslly, it msy hs said, with all due rsspect to scientifio dscorum, that ths appearance of a grsat comst doss exert one most happy influsnce on ths sarth, in that it stimulates ths curiosity of mankind, and directs their thoughts to ths more partionlar contsmplation of ths glorious univsrss which snrrounds them.

Phosphorescent Coral.

C. F. Holder, in ths *Scientific American*, says: "Ths appsarances of phosphorescsnt light among corals is of sxtrsmsly rare occurrence, and during a long residsnce in the coral conntry, and of continusd obssrvation, the phenomenon was only obssrved onco, and that in ths gsnus *Caryophillia*. The spscimsn was first ssen from ths hoat in about 30 ft. of water, and brought np hy diving, immediately placed in a jar of water, and finslly transferrsd to an squarium that had heen huilt so that the tids rose and fell in it. Hers the beantiful specimsn was lodgsd, so that evsry movement of the animal could he obsarved. It had five hranches, each one forming a cell showing heautiful radiating plates, striated extsrnally, and collected into a solid conicsl polyparium fixed at ths hase. In this specimen the green was only faintly obssrvsd; and when the animal was within its cell the color of the mass was more inclined to yellowish hrown.

The situation of the coral was ahout n foot nndsr the surfacs, and a platform had been arrangsd so that ths obssrver conld watoh it from the watsr's edgs, and while so doing ths light was first seen. At first we thought it might have heen the phosphorsscent flash of soms minnts acsleph, myriads of which wsre floating ahont, hut to remove all douht a glass funnsl, slightly tintsd, was gently lowsred down ovsr it, and a second later a slight flssh illuminated it, and thsn another, showing a faint light that made small objects visihle in the immediats vicinity of the polyp; and at one time a pteropod was snddenly thrown into a hrilliant light whsn within a fsw inches of it. Ths flashss sesmed to hs intermittsnt, and to pervade the entirs facs of ths csll in much the same fashion as does ths light of the firefly ths surfsoe of that inseot. By lowering a hlack glass near it an idsa was ohtained of ths sizs of ths reflsction which was on ths glass, an oval illuminatsd spot sesmingly ahout the size of a silver qunrtsr, and the color of the spark ysllow, with perhaps n hlnish tint.

The Asteroids.—The nnmber of asteroids that have heen discovsred is now 220. Recent researches hy Hsrr Hornstein, commnnicated to the Visnna Acadsmy, appear to prove that the nnmhsr of those with a diamster of ovsr 25 geographical miles is extrsmely small, and that prohably all sucb wers discovered hefors 1859. On the other hand, ths numherof asteroids with a diamster less than fivs miles, seems also to hs very small, at least in the parts of ths astsroid zons next to Mars; in the outer regions nsxt Jupitsr thers may hs a more considsrahle number of these very small bodies. Most asteroids sesm to have a diamster of hetwssn five and 15 milss. Ths avsrags nnmber of asteroids with a diamstsr of hvs to tsn miles discovsred annually within the last 20 years is ahout thres; the numhsr of those of ten to 15 miles diamster ahout 1.6. Thus, should no telescopes grsatly more powerful than ths pressnt onss hs ussd in the futnre in ssarch for thsse hodiss, we may sxpect hut a moderats "find" of astsroids with diamstsrs under five or ovsr 15 gsographical milss, while a considerahls increase of those witb diameters of five to 15 milee may hs looked for. It further appears that in the case of smaller asteroide of five to ten milss in diameter the improvement of optical instrnments and star maps has resnlted in no great increase of annual discoveries in the inner zone; such an increase is observed only in the outer zone. Within certain zone limits there is an increase of the average nnmher of yearly discoveries with the time and with the distanoe from the sun; hut heyond the outer limit thie increase ceasss.—*London Times.*

A New Motor Gas.—It is stated that a French chemist has devised a way of producing gas from carhonate of lime to hs used as a motor, which it is said will furnish the cheapest motive power known. Chalk or lime is one of the most ahnndant materials of which the crust of the earth is composed, and a cheap motive power furniehed hy its disintegration would revolutionize transportation. Several tramways are heing run in France hy this motor. The gas can he extracted from the stone and stored, and after heing used condensed again.

Photography of Gas Flames.—Gas-fitters have recently made a most useful application of photography. They photograph gas flames given hy different hurners or jets, so that a customer can see if the shape and form of a light will suit him hsfore he gives his order. As the flames are, moreover, depictsd "life-size," the purohaser can always tell whether his jet is np to tbe standard.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jan. 26		Week Ending Feb. 2.		Week Ending Feb. 9.		Week Ending Feb. 16.	
Alpha	1.35	1.00	2	1.90	2.15	1.60	2.10	1 80
Alta	5⅝	4.95	5½	5⅛	5⅝	5	4.40	3
Andes	90c	85c	90c	75c	70c	65c	65c	50c
Albion	1.90	1.80	2.45	1.85	2¼	2.10	2¼	1.90
Argenta	....	....	....	....	....	....	....	....
Addenda	....	....	....	....	....	....	....	....
Belcher	1.45	1.30	1.40	1.15	1.10	1	1.05	55c
Belmont	85c	75c	80c	70c	70c	....	70c	....
Best & Belcher	7⅞	7⅝	7⅞	7¾	7¼	7¼	7¼	6⅞
Bullion	90c	80c	1	90c	95c	85c	85c	45c
Bechtel	50c	35c	....	....	35c	....	....	....
Belle Isle	20c	5c	....	....	....	....	....	....
Bodie	4.10	3.35	3.80	3.20	3.55	3.35	3.40	3
Benton	1.10	70c	95c	85c	1.05	95c	75c	65c
Bulwer	2¾	....	2.60	2¾	2¾	....	....	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	10c	5c	5c	....	....	....	....	....
Belvidere	10c	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	30c	....	30c	25c	25c	15c	20c	15c
California	35c	25c	30c	25c	25c	20c	20c	10c
Challenge	55c	....	....	....	40c	....	40c	....
Chollar	1.20	1.10	1¼	1.20	1¼	1.10	1.35	1.05
Confidence	1.95	1.85	2¼	2.10	2	....	12	1¼
Con Imperial	5c	....	5c	....	15c	2c	10c	....
Con Virginia	1.15	1.05	1.10	80c	75c	70c	75c	50c
Crown Point	90c	75c	1	75c	75c	70c	75c	55c
Columbus	....	....	....	....	....	....	....	....
Champion	10c	....	....	....	....	....	....	....
Concordia	....	....	85c	80c	....	....	90c	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	35c	25c	15c	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	1	....	1	75c	85c	80c	85c	80c
E. Mt. Diablo	50c	45c	50c	40c	45c	40c	45c	35c
Eureka Con	13	....	....	....	12	11½	12¼	11½
Exchequer	75c	65c	75c	70c	75c	65c	75c	55c
Endowment	5c	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	2¼	2	2¼	2	2¼	2	2	1.90
Goodshaw	45c	40c	60c	50c	40c	37c	50c	30c
Gould & Curry	4	3.80	4	3.95	3.80	3.30	3.40	2.90
Hale & Norcross	2.30	1.20	2¾	2.35	2.45	2.15	2¼	1½
Head Center	90c	....	80c	75c	70c	40c	15c	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	10c	5c	10c	5c	5c	....	5c	....
Justice	1.05	85c	1	90c	1.10	95c	95c	75c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	....	....	....	80c	....	85c	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	15c	....	15c	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leads	....	....	....	....	....	....	....	....
May Bells	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1¼	....	....	....	....	....	....	....
Martin White	2¼	....	3	2.95	3¼	3.20	4.60	4.10
McClinton	....	....	....	....	....	....	10c	5c
Mono	1.85	1	1.45	1.05	1¼	1	1	95c
Mexican	10½	9¾	10½	9¾	10¼	9¾	10½	8¾
Mt. Diablo	8¾	7¾	8	7¾	7¾	....	7¼	6½
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	30c	5c	25c	20c	30c	20c
New York	....	....	....	....	....	....	....	....
Northern Belle	10	8¾	10¾	9¾	11	10¾	11	9¾
North Noonday	10c	5c	5c	....	10c	....	....	....
Navajo	65c	55c	65c	....	60c	55c	6.c	40c
Occidental	....	....	....	....	90c	....	....	....
Ophir	6¾	5¾	6¾	6	5⅞	5¾	5¾	4¾
Original Keystone	....	....	....	....	....	....	....	....
Overman	1.20	95c	1.10	95c	1¼	75c	1.10	65c
Oro	15c	10c	15c	10c	30c	10c	30c	25c
Paris	1	....	1	....	1¼	....	1¼	....
Potosi	1.45	1.40	1.70	1¾	1¼	1.40	1.30	1.05
Queen Bee	5c	....	....	....	5c	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.60	1.30	1.70	1.60	2.10	1¼	1.85	1¼
Sag Belcher	....	....	4.90	4¼	5.55	5¼	4.05	3
Sierra Nevada	8¼	7¾	9¼	8	8¾	8¼	8¼	7
Silver Hill	25c	20c	20c	....	15c	....	....	....
Silver King	19¾	19	....	....	19	18¾	19	18¾
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	10c	....	....	....
Scorpion	1	95c	1.05	95c	95c	90c	90c	70c
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	5c	....	10c	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	....	....	25c	....	25c	....	25c	15c
Tioga Con	15c	10c	15c	10c	....	....	25c	20c
Tiptop	4¾	4½	4¾	4 20	....	....	....	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	11⅝	10¾	11⅝	11	11⅛	10¾	11⅛	9¾
Utah	5¾	5¼	5⅝	5⅜	5⅜	5	5¾	4.95
Ward	3.60	3¾	3¾	....	....	....	3.70	3¼
Wales	80c	75c	75c	....	1	90c	85c	70c
Yellow Jacket	2.90	2.60	3	2.65	2.25	2.15	2.05	1¾

Sales at S. F. Stock Exchange.

Thursday A.M., Feb. 16.

50 Sag Belcher.....3
120 Alpha.....1.80
775 Scorpion.....70@65c
415 Alta.....3.15
50 Utah.....5¼@5⅜
150 Andes.....50c
670 Union.....9⅜@10¼
110 B & Belcher.....6⅜
230 Yellow Jacket.....1.55
270 Belcher.....60c

AFTERNOON SESSION.

160 Bullion.....50@45c
100 Bodie.....2.85
50 Beuton.....65c
2030 Belding.....25c
250 Confidence.....1¼
50 Bulwer.....2.55
700 California.....15@10c
300 Bodie Tunnel.....1.95@2
720 Con Virginia.....55@50c
100 Day.....85c
150 Chollar.....1.05@1.10
450 E Mt. Diablo.....30c
200 Crown Point.....90c
100 Eureka Tunnel.....1.65
100 Con Imperial.....10c
100 Holmes.....30c
460 Exchequer.....60c
75 Mt Diablo.....6⅜
100 Gould & Curry.2.95@2.90
100 Mono.....85c
525 Hals & Nor.....1.55@1⅜
600 M White.....1¼
45 Justice.....75@80c
50 Noonday.....20c
845 Mexican.....8@8⅜
60 Northern Belle.....9¼
325 Ophir.....4¼
100 Oro.....20c
300 Overman.....65c
155 Pinal.....2¾
100 Potosi.....1.05
50 Southern Nev.....5¼
210 Savage.....1⅞@1.55
50 Silver King.....18⅜
220 Sierra Nevada.....7
270 Walss.....60c

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Horn Silver, Feb. 7th, $15,000; Barbee & Walker, 7th, $3,185; Stormont, 7th, $7,795; Germania, $5,100; Hanauer, 7th, $2,150; Horn Silver, 8th, $22,500; Tintic, 8th, $3,321; Horn Silver, 9th, $12,500; Germania, 9th, $2,600; Hanauer, 9th, $2,160; Northern Belle, for Jan., $66,470; Standard, for Jan., $145,954 in gold and $14,197 in silver; Syndicate, Feb. 6th, $6,596; Star, 6th, $1,618; Eureka Con., 4th, $4,893; Standard, Jan. 31st, $14,839; Northern Belle, Feb. 6th, $8,393; Bodie, 12th, $8,860; Northern Belle, 9th, $7,979; Star, 8th, $1,457; Tiptop, 11th, $10,000; Ophir, 4th, $12,484; Eureka Con., 6th, $1,779; Mt. Diablo, 10th, $8,516; Inyo Con., 13th, $20,000; Caledonian, for Jan., $12,000, Father de Smet, Jan. 8th, $22,500; Homestake, Jan., $22,000; Star, Feb. 10th, $1,278; Contention, 15th, $18,858.

THE profits of the Richmond M. Co., Nevada, during the past six months, after paying all expenses, have been over a quarter of a million of dollars.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	15	50	Jan 6	Feb 9	Mar 2	W Willis	309 Montgomery st
Andes S M Co	Nevada	18	25	Feb 2	Mar 9	Mar 30	B Burris	309 Montgomery st
Belcher S M Co	Nevada	29	50	Feb 6	Mar 11	Mar 31	J Orockett	327 Pine st
Belvidere M Co	California	13	25	Feb 9	Mar 14	Apr 3	C V D Hubbard	310 Pine st
Best & Belcher M Co	Nevada	22	50	Jan 4	Feb 7	Feb 23	Wm Willis	309 Montgomery st
Bodie Con M Co	California	1	50	Dec 6	Jan 24	Feb 23	W H Lent	309 Montgomery st
Bullion M Co	Nevada	23	50	Jan 19	Feb 21	Mar 14	J M Brazell	328 Montgomery st
California M Co	Nevada	2	20	Jan 18	Feb 25	Mar 22	O P Gordon	309 Montgomery st
Champion M Co	California	10	25	Jan 12	Feb 20	Mar 13	B Burris	309 Montgomery st
Chollar M Co	Nevada	7	25	Jan 9	Feb 14	Mar 7	W E Dean	309 Montgomery st
Con Imperial M Co	Nevada	17	10	Jan 4	Feb 8	Mar 1	W E Dean	309 Montgomery st
Con Pacific M Co	California	4	25	Jan 28	Mar 3	Mar 27	F E Luty	330 Pine st
Con Virginia M Co	Nevada	17	50	Jan 31	Mar 11	Apr 8	A W Havens	309 Montgomery st
Day S M Co	Nevada	10	50	Jan 28	Mar 6	Apr 3	E M Hall	327 Pine st
Equitable T & M Co	Utah	26	10	Feb 2	Mar 9	Mar 23	C J Collins	512 Montgomery st
Exchequer M Co	Nevada	18	25	Jan 12	Feb 15	Mar 6	C E Elliot	327 Pine st
Gould & Curry S M Co	Nevada	42	50	Jan 12	Feb 16	Mar 9	A K Durbrow	309 Montgomery st
Julia Con M Co	Nevada	17	20	Jan 17	Feb 24	Mar 16	H A Charles	419 California st
Mariposa Land & M Co	California	22	25	Dec 23	Jan 31	Feb 28	L Leavitt	309 Montgomery st
Martin White M Co	Nevada	11	25	Jan 20	Mar 2	Mar 30	J J Scovills	309 Montgomery st
McMillen M Co	Arizona	4	30	Feb 8	Mar 14	Apr 12	J Morizio	323 Montgomery st
Modoc Con M Co	California	10	30	Feb 14	Mar 28	Apr 25	J W Pew	310 Pine st
Mono G M Co	California	16	30	Feb 7	Mar 14	Apr 3	W H Lent	309 Montgomery st
Monumental M & M Co	Nevada	1	05	Dec 30	Jan 31	Feb 21	D B Chisholm	327 Pine st
Napoleon M Co	California	1	03	Jan 13	Feb 13	Mar 2	H Smith	309 Montgomery st
New York M Co	Nevada	27	15	Jan 18	Feb 21	Mar 13	F E Pietz	327 Pine st
Noonday M Co	California	5	25	Dec 30	Feb 8	Mar 2	W J Taylor	310 Pine st
North Noonday M Co	California	5	25	Dec 30	Feb 10	Mar 6	W J Taylor	310 Pine st
North Standard G & S M Co	Cal	2	10	Nov 30	Feb 1	Feb 20	C V D Hubbard	310 Pine st
Overman S M Co	Nevada	52	50	Jan 9	Feb 14	Mar 7	Geo D Edwards	414 California st
Pinal Con M Co	Arizona	2	30	Jan 24	Mar 7	Apr 3	W W Traylor	309 Montgomery st
Rex Montis M Co	California	14	25	Jan 9	Feb 14	Mar 10	J W Ward	426 California st
San Jose M Co	Nevada	18	75	Jan 30	Mar 15	Apr 12	A Carrigan	109 Front st
Savage M Co	Nevada	49	50	Jan 6	Feb 8	Feb 23	E B Holmes	309 Montgomery st
Sag Belcher M Co	Nevada	21	1 00	Feb 14	Mar 20	Apr 10	G D Fewards	414 California st
Sierra Nevada S M Co	Nevada	71	1 00	Jan 29	Feb 1	Feb 20	E L Parker	309 Montgomery st
Silver Hill M Co	Nevada	17	15	Feb 2	Mar 9	Mar 29	W E Dean	309 Montgomery st
Spaulding G & S M Co	California	2	10	June 23	Feb 23	Mar 24	J W Pew	310 Pine st
Tioga Con M Co	California	15	10	Jan 12	Feb 16	Mar 8	W H Lent	309 Montgomery st
Tombstone Con G & S M Co	Arizona	1	02	Jan 9	Feb 13	Mar 6	J M Buffington	309 California st
Utah S M Co	Nevada	37	1 00	Jan 14	Feb 17	Mar 7	C O Pratt	309 Montgomery st
Yellow Jacket S M Co	Nevada	44	1 00	Feb 7	Mar 4	Apr 11	M Otey	327 Pine st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Bay State S M Co	Nevada	1	02	Dec 29	Feb 6	Mar 6	J W Pew	310 Pine st
Bed Rock M Co	Arizona	1	05	Feb 6	Mar 13	Apr 3	C H Graves	6 Post st
Blue Bell Con M Co	Nevada	2	50	Jan 19	Feb 24	Mar 17	H P Rush	431 California st
Butte Creek Hydraulic M Co	California	8	10	Dec 29	Feb 15	Mar 6	A L Taylor	230 Montgomery st
Excelsior Deep Grav M Co	California	17	25	Jan 10	Feb 14	Mar 7	D B Chisholm	327 Pine st
Excelsior W & M Co	California	3	1 00	Jan 9	Feb 10	Mar 2	L C McAfee	328 Montgomery st
Golden Fleece Grav M Co	California	24	30 00	Jan 31	Mar 4	Mar 23	F Schirmier	735 Folsom st
Gray Eagle M Co	Nevada	2	50	Jan 11	Feb 20	Mar 20	H Dess	309 Montgomery st
Little Chief M Co	California	1	5 00	Jan 13	Feb 17	Mar 11	S C Dean	22 California st
Magnelle Con M Co	California	10	20	Dec 31	Feb 7	Mar 1	W J Taylor	310 Pine st
Mayflower Grav M Co	California	14	10	Dec 30	Feb 3	Feb 23	J Morizio	323 Montgomery st
Oro M Co	California	11	15	Jan 7	Feb 13	Mar 7	W Stuart	320 Sansome st
Pinal Copper Co	Arizona	3	2 50	Jan 28	Mar 27	Apr 17	G T Shaw	340 Fourth st
Ready G M Co	California	3	04	Dec 31	Feb 4	Feb 25	R D Hopkins	436 Montgomery st
Rocky Point M Co	California	10	05	Jan 13	Feb 13	Mar 6	D M Kent	339 Pine st
Sizzorney G & S M Co	California	3	03	Jan 24	Feb 28	Mar 20	A Judson	320 Sansome st
South Hite G M Co	California	3	10	Jan 9	Feb 16	Mar 7	F A Berlin	420 Montgomery st
Vanderbilt M & M Co	Nevada	3	05	Jan 16	Feb 21	Mar 16	J Morizio	328 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alexander M Co	——	A B Cooper	328 Montgomery st	Annual	Feb 25
Arizona G & S M Co	Utah	N G Carroll	320 Sansome st	Annual	Feb 24
Belding M & M Co	——	R W Heath	318 Pine st	Annual	Feb 20
Cameron C & S M Co	——	W J Blattner	Stock Ex	Annual	Feb 20
Cataract & Wide West Gr M Co	Cal	W B Lake	240 Montgomery st	Special	Feb 28
Golden Chariot M Co	Idaho	J T McGeoghegan	318 Pine st	Annual	Mar 6
Maryland Con M Co	——	E P Farnsworth	219 Sansome st	Annual	Mar 6
Murchie G & S M Co	——	W Letts Oliver	328 Montgomery st	Annual	Feb 21
Saratoga G M Co	——	R W Heath	318 Pine st	Annual	Feb 20
Silver Belt M Co	Arizona	J W Pew	310 Pine st	Annual	Feb 21
Swansea M Co	California	M A Wheeler	320 Sansome st	Annual	Feb 18
Tsirakoff Con G M Co	——	W J Carnett	310 California st	Annual	Feb 18

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	California	W Letts Olivsr	328 Montgomery st	20	Dec 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Feb 13
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Feb 15
Silver King M Co	Arizona	J Nash	315 California st	25	Feb 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Feb 13
Standard Con M Co	California	Wm Willis	309 Montgomery st	75 (extra)	Jan 12
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10	Jan 3
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10 (extra)	Jan 3
Western M Co	California	C S Curtiss	309 Montgomery st	75	Dec 22

Mining Share Market.

Stocks are very weak and quiet, as will be seen by referring to our table of sales. The flow of water from the Exchequer into the Jacket is still very strong. The water is several ft. above the 2828 level of the Yellow Jacket mine, causing the stoppage of all underground work. It also stops work in the Imperial and adjoining mines. While some say the flow of water is from a natural reservoir, others assert that a drift was accidentally run into some old workings that have been filled with water for several years. The *Enterprise* thinks there is likely to be found a good body of ore in the "hig hend" of the lead. This curve occurs in Mexican ground. The south drift from the bottom of the joint Mexican and Union Consolidated ground is now cutting seams and stringers of ore, and good ore—not merely favorable assays. This would appear to show that a body of ore of value is at hand.

Crosscut No. 1, on the 2700 level of the Union Consolidated, is looking very well. The diamond drill has been put into the face. While the drill shows a considerable amount of water, it does not show a quantity sufficient to interfere with the operations of the workmen. The ground through which the drill has been passing is very soft, on which account, and on account of the water, it is impossible to obtain reliable assays. All that can be said of this section of the mine therefore, is that the assays are very favorable without being perfectly trustworthy.

Work has again been resumed in the drift south from the bottom of the joint Ophir and California winze on the 2700 level.

The Horn Silver (Utah) dividend of $300,000 was paid at New York last Tuesday. This is the largest dividend that any silver mine in the United States is now paying.

The Ontario Mining Co., (Utah) have declared a dividend of 50 cents per share, or $75,000, payable immediately. This is the 71st consecutive dividend, and aggregates $4,100,000.

THERE are in Nevada county 350 square miles, more or less, of auriferous gravel channels that can be mined by the hydraulic process only.

THE PURCHASE OF MUTILATED COINS.—The following circular has been issued by Director Burchard, of the Mint Bureau, regarding the purchase of mutilated silver coins at the Mints of the United States: The Superintendents of the United States Mints at Philadelphia, San Francisco, Carson and New Orleans, have been authorized to purchase mutilated and uncurrent United States silver coin of standard fineness, at the rate of $1 per ounce, troy weight, when presented in sums of $3 and upwards. Coins can be forwarded to those Mints by registered mail, or by express (charges prepaid), and the value will be returned, at the seller's risk and expense, by express, registered mail, check or draft. Persons sending full-weight United States subsidiary silver coins would receive, at the rate authorized, eighty cents per $1 of their face value, but for mutilated coins, a less amount, proportioned to their deficiency in legal weight. At the rates paid, mutilated silver coins will be worth at the Mints: Per ounce, troy, $1; per ounce, avoirdupois (about), 91; per $1, face value (approximately), 70 to 76.

WORKING TAILINGS.—The Pioche *Record* thus describes the method of working over the tailings of the rich ores that went through the mills in the palmy days of Pioche: "The thirteen tables now in operation at Bullionville run through about 50 tons of tailings every 24 hours. It takes about four tons of tailings to make one of concentrations. The concentrations average about 50% lead and 60 ounces of silver. After coming from the tables they are hoisted by a powerful China pump into two large tanks, from which place they are put into a mill—invented by St. Pierre, of Bullionville, for that purpose—and thoroughly mixed with a certain proportion of lime, after which they are spread on the yard, and when dry are ready to be put through the furnace."

FIVE copper mines in Arizona produced 8,100,000 lbs. copper last year, including nearly 5,000,000 lbs. by the Copper queen Co. This company expects soon to produce 1,250,000 lbs. per month.

MINING SUMMARY.

This following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

GRAVEL.—Amador *Dispatch*, Feb. 14: Jas. Coyner is making preparations to open a gravel claim north of town. He intends to work it with a hydraulic. It is a very favorable location. Knight & Co.'s machine shop has been running night and day this week in order to have a 10-stamp mill completed on contract time. It is for El Dorado county.

BUTTE.

MORE GOLD.—Butte *Record*, Feb. 12: A prominent miner of Butte creek brought $1,500 in gold dust to town yesterday and deposited it in the Bank of Butte County, and it was sent to San Francisco this morning. The gold is of a very pure quality, and is the result of only a few days' clean-up. Fifteen hundred dollars is about the average amount taken from the Butte creek mines every 2 weeks. The gold brought dowo is always well guarded, 3 men generally coming along with Winchester rifles, and highwaymen attempting to stop these men would find tough customers to deal with, as they are plucky men and would fight as long as they could handle a shooting-iron. It is expected that much larger amounts will be taken from these claims as soon as the light spring rains set in.

CALAVERAS.

LAMPHEAR MINE.—Calaveras *Chronicle*, Feb. 11: Work on the Lamphear mine is progressing favorably. The mine is entirely free from water, and the hoisting works are up and work splendidly. Ore is now being taken out and there is a considerable quantity already on the dumps. The ore prospects well. The mill—a 12-stamp battery—is fast approaching completion, and is expected to be in operation in a few days. In fact all the fixtures of the mine are first class, and there is not the least doubt but that the Lamphear mine will prove itself a valuable piece of property.

EL DORADO.

DITCHES OPEN.—Georgetown *Gazette*, Feb. 10: The ditches of the Cal. W. & M. are now open, and everybody is happy, and none more so than Mr. Findley. The golden dust will soon begin coming in again and our merchants will look better natured. Some of them were beginning to look terribly down in the mouth. Their books were filling up faster than their pockets Managing Director Findley of the Cal. W. & M. Co., has returned from a week's visit to the Bay, radiant with health and buoyant over the outlook of prosperous times for the year just opening. He finds the ditches, which have been clogged with ice and snow, running more freely; that the Eureka clean-up was very favorable; that a number of prospect quartz mines are showing up well; that several new orders for water have been spoken for, and gratifying to note, he finds the citizens of Georgetown possessed with a spirit of increased assurance over the prospects of increased trade.

MT. GREGORY.—We notice that A. J. Wilton is down from Kentucky flat. He is quite enthusiastic over the mining outlook in the vicinity of Mt. Gregory, and well he may be, for we hear of nothing but flattering reports of the mines there.

INYO.

CERRO GORDO.—Inyo *Independent*, Feb. 11: Supt. M. A. Wheeler, of ths Swansea M. Co., paid Independence a business visit during the week. He is working the Nemesis and Original mines, properties formerly owned by Joe Diaz, situated in lower Cerro Gordo. As soon as they, in connection with the Palma, are sufficiently well opened to insure 20 tons of ore per day—the early accomplishment of which work there can be no doubt—it is probable that ths Hawley mill on the lake will be leased and run by the Swansea Co. As we predicted when the company bought the Palma, or Gold Hill mine, Mr. Wheeler will not allow the mines to lie idle.

MARIPOSA.

BEAR VALLEY.—Cor. Mariposa *Herald*, Feb 14: D. Walton Birmingham, the efficient and gentlemanly superintendent of the Mariposa Land and Mining Co., has been called to New York on important business connected with the estate. He left here last Sunday, Feb. 5th, with the expectation of returning to Bear valley in one month or six weeks; and upon his return we all may rely upon a vigorous prosecution of the works upon the estate at the following points: River Tunnel, Josephine, Princeton and Mariposa mines. The first operations will be, in all probability, at the north end of ths estate, in the River Tunnel—where the last work developed a large vein of quartz—known as the Succudo mine. The vein is some 30 ft in thickness and sunk upon 500 ft from the level of the main tunnel, and drifts run southeasterly 700 ft, all showing the same width of vein. This immense size of vein at this depth and the length that has already been run upon it, must eventually lead to a big bonanza.

COMPROMISE MINE.—The new mill on this mine was started up during the first week in January last, but owing to the severe frosts the necessary supply of water was cut off, and as a consequence the mill was stopped until the 3d inst., when it again started up. What made the stoppage more annoying to the owners of the mine was the fact of having plenty of rich ore on the dump, to which they were constantly adding from the mine. Precautionary measures will be taken to guard against a recurrence of the cause of delay next winter. The mill run 4 days and a half and cleaned up 850 lbs. of amalgam, being at the rate of nearly a lb. per hour for the time of crushing ore. The quantity crushed was all taken from the shaft in sinking. The rock is getting richer as the sinking progresses. The new shaft is now down 100 ft below the old level. The old level is in 300 ft on one side and 150 on the other, and at a depth of 70 ft from the mouth of the shaft. The miners are now making stations in the new shaft 100 ft below the old level, for the purpose of running another level. This will give 100 ft of stope on both sides for 450 ft. The wealth of the mine is, from present appearances, wonderful. The deeper the miners delve, the richer is the rock. The rock, according to careful estimates by credible and uninterested miners, will yield between $50 and $60 per ton. Such a scarcity of water caused the mill men to start up 8 times in order to run 4½ days.

MONO.

BODIE.—*Free Press*, Feb. 14: During February, March and April some interesting ground in Bodie will be prospected by crosscuts. The Standard Con will take a look at the 1200-ft level during that time and during the coming summer. At present ths crosscut on the 1000-ft level is in a good looking formation and a body of ore is liable to be encountered on that level almost any day. Crosscuts from the Lent shaft will also cut through an interesting country. Faith continues in the permanency of the Standard and Bodie mines, and it is to be hoped that those who are spending the money for prospecting will realize handsomely before another year rolls around. The Oro shaft is now down 750 ft and a sump is being cut out. Crosscutting will soon commence to prospect the veins encountered in the upper levels. The stock is now quoted at low figures and we look for an advance in the distant day. The Tioga is looking better than it has for some time, while the Noondays are extracting the usual amount of ore. To-day the Bodie Tunnel mill will start up on ore, the break in the machinery having been repaired. It is reported that several of the hoisting works now idle will soon resume operations; that the Belvidere, Dudley, and one or two other mines controlled by H. M. Yerrington, will be worked. Such a change for the better would be of the utmost value to this camp and the district generally. It is well known that the Dudley has a body of ore, but owing to the water and the present light machinery nothing can be done on the lower levels.

PLACER.

CEMENT MILL.—Placer *Times*, Feb. 11: The new 10-stamp cement mill in the Hayward claim, at You Bet, John Spaulding superintendent, is being run to its fullest capacity crushing about 70 tons of cement each day. This mill has just been put up in the mine this winter and has only been running a short time. The first clean-up has not yet been made and the result of extracting the gold from the hard cement by means of crushing is not definitely known. The prospects favor a good clean-up.

PLUMAS.

SAVERCOOL MINE.—Butte *Record*, Feb. 10: Mr. Wm. Savercool, one of the late owners of the famous Savercool quartz mine, of Plumas county, returned from New York this week and is registered at the Chico hotel. He will leave for Greenville to-morrow, going by wagon until he reaches the snow, when he will take snow-shoes and make the remainder of the trip. He has considerable baggage which he says will be taken over the mountains by Indians on sleds. The Savercool mine is one of the largest and richest in the State. Its former owners put in the best quartz crushing machinery last spring that could be purchased, and the result is that the Savercools, who began poor, have, within a few months, become immensely wealthy. The mill has been idle for some three months, but a large number of men have been kept at work in the claim. Mr. Savercool informed a *Record* reporter this afternoon that his trip East was for the purpose of selling the mine. He succeeded in disposing of the mine to the New York M. Co. He said that mining operations would begin in the spring with a "boom." The New York Co. will put in over $50,000 worth of machinery.

SHASTA.

FUO ITEMS.—Shasta *Courier*, Feb. 11: Our burgh continues to flourish notwithstanding the recent shutting down of the Centennial Con. It is understood that this suspension is to be but temporary, a preparation for a new deal. The Chicago mine continues to yield the superior quality of ore mentioned a few weeks ago. The carload which the owners propose to ship below is almost completed and a portion thereof is already at the depot. The Hardscrabble continues in operation with two giants, although the scarcity of water is beginning to be felt. A large scope of the surface, as deep as the flume will carry it, has been cleared, leaving a sufficient space for one or two season's work with an elevator. The Deer mine, below Horsetown only awaits water to begin operations, for which the past several months have been spent in preparation. Mr. Deer has put in a 50-ft elevator which has the power to "lift things." Smaller enterprises are yielding highly satisfactory returns, and altogether our people are prosperous and happy.

SIERRA.

SIERRA COUNTY AT THE FRONT.—*Tribune*, Feb. 8: A quartz specimen taken from the Rainbow mine last summer and shipped to London, where it has been on exhibition, was worked at that place recently, the net value being $23,000. It was probably one of the finest single quartz specimens ever found in the State.

HARLEM MINE.—The superintendent's report from the Harlem mine at Alleghany to the company in New York, is that "No. 3 tunnel is being pushed rapidly ahead and prospecting well."

SCALES' DIGGINGS.—Charles Hendel & Co. have suspended operations in their bedrock tunnel, until a new survey be made. The Union Hill Co. have been running full blast at their claim. Since last writing we have had about 3 ft of snow, and some quite severe winds. Last night the thermometer stood 10° above zero.

ALASKA MINE.—The Alaska Co.'s 20-stamp mill is running regularly. Some very fine looking ore is being taken from the mine, showing free gold in abundance. Thirty miners are employed at present. We understand the company will commence sinking their main shaft at an early date.

THE GOLDEN STAR.—Will. Hanley is working quite a force of men at the Golden Star drift mine, Alleghany. The company has expended $100,000 since commencing operations on this claim. But, from the fact that the section in which the Golden Star is located seldom fails to yield satisfactory returns to those who develop its resources with honesty, economy and judgment, there is no doubt but that the company referred to will soon have been recompensed for the vast amount expended by it.

DIVIDEND DECLARED.—The Bald Mt. Drift Mining Co. of Forest City declared a dividend of $5 per share this week.

MORE LIENS.—*Mountain Messenger*, Feb. 11: A gentleman by the name of Booth, of San Francisco, has filed a lien against the Marguerita quartz mine and mill for $2,000, machinery furnished. Some of the workmen at this mine were paid only 25 cents on the dollar.

SUFFOLK.—The Suffolk Co. at Wahon is still busy blasting for a dump, but will soon have it completed.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.—*Enterprise*, Feb 12: On the 2700 level the main north lateral drift has been extended 15 ft and the joint Union Consolidated east winze has been sunk 9 ft.

ALTA.—We have been engaged the greater part of the week in clearing out and enlarging the sub-drain in the east drift, which is now in good shape. Rock hoisted, 411 cars; wood consumed, 76 cords; strokes made by pump, 71,200.

YELLOW JACKET.—On the 2328 level work in the east crosscut was suspended and the men put to work cleaning out the south lateral drift on the same level. This drift connects with the Crown Point and Belcher workings and has been badly caved and filled with debris since the mine was flooded. Work on the 3000 level has been delayed during the past week by the flooding of the same, caused by a large flow from the Crown Point 2700 level.

UTAH.—On the 2500 level the east drift has been advanced 36 ft. The pumps are running all right

OPHIR.—During the week 24 tons of ore were extracted from the croppings.

CON. VIRGINIA.—Are still cleaning out and repairing drifts and winzes on the 1650 and 1750 levels connecting with the old Con. Virginia shaft.

MEXICAN.—On the 2700 level the main north lateral drift has been extended 21 ft and the main south lateral drift 11 ft. This drift is showing ore giving fair assays.

CALIFORNIA.—On the 1050 and 1750 levels are still cleaning out and repairing the drifts and winzes connecting with the old Con. Virginia shaft.

UNION CON.—The east drill hole has been extended 210 ft. The joint Sierra Nevada east winze has been sunk and timbered 9 ft.

BATTLE MOUNTAIN DISTRICT.

ANTIMONY.—Lewis *Herald*, Feb. 8: Lumber has been sent to the McCullough antimony mine and a force of men will be set to work as soon as the weather permits. This mine is situated in Cottonwood canyon, in old Battle Mountain mining district, and was formerly owned by A. M. Starr, of San Francisco. We understand that a New York company have taken the mine in hand and will develop it. J. L. McCulloch will have charge of the work, and under his able management we are satisfied the mine will be thoroughly prospected and its merits exposed.

CAMPBELL DISTRICT.

ORE.—Lewis *Herald*, Feb. 8: The Hoskins Bros., from Campbell district, arrived Saturday night. They are taking out some very rich ore, the streak being about five inches wide. Several tons of ore are on the dump ready for shipment. The ore carries a large per cent. of lead and has to be smelted.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, Feb. 11: Thirteen ft have been added to the depth of the main shaft during the week. The total distance made since sinking commenced has been 50 ft. The fourth shaft level continues to look well, and the ore upon which sinking is being done in the drift run from the 25-ft winze shows an average grade of $70 per ton. A very important development has been made during the week in the west part of the mine. It is on the 10th level, where some very fine ore has been opened into which so far as proved shows an average width of 4 ft and looks very promising. At this point facilities for extraction are quite limited, but a crosscut is being run which will reach the ore in about a week and enable its extraction quite easily. The daily yield of ore has been about 01 tons. Mill No. 1 started up on the 1st inst. and is running half time on Mount Diablo ore Mill No. 2 is doing its usual work on Northern Belle ore. Shipments on February account to February 9th, $16,353.43.

MOUNT DIABLO.—The general appearance of the mine is much the same as at the time of the last report. The west drift on the second level is giving some $150 ore from a small streak that appears well. The stope on the first level continues to look well and is yielding very good ore.

PRINCESS.—The retimbering of the shaft still continues and is progressing favorably. One or two days were lost during the week owing to a scarcity of timber, the antichated supply not arriving on time.

ESMERALDA DISTRICT.

CORTEZ MINE.—Esmeralda *Herald*, Feb. 11: The more work done the better and more encouraging the prospect. The drift toward the Utah on the lower tunnel level shows a solid ledge of high grade ore the full width of the drift. In the incline the ledge maintains its usual width. Rumor has it that more miners were to be put on next week, but Supt. Wells informs us that there is no foundation for such rumor.

GALENA DISTRICT.

PLUMAS MINE.—Lewis *Herald*, Feb. 8: Capt. Dahlgren intends thoroughly exploring the Plumas mine in Galena. The purchase money is on deposit, but before accepting it, Capt. Dahlgren insisted that he should expend a certain amount of capital on the mine, and prove to the satisfaction of the purchasers that the property was as represented. A force of men are now at work on the mine, and at least $5,000 will be expended in opening up the property. We are pleased to see that some parties have faith in the mines of Galena, and hope to see our sister camp once more resume its place among the bullion producing camps of Nevada.

GRANTSVILLE DISTRICT.

THE CENTENNIAL MINE.—*Bonanza*, Feb. 11: Work on the Centennial mine is progressing splendidly. The ore continues to improve in all the levels in both north and south shafts. Men have been put to work in what is known as the west shaft, finding same grade of ore, which as developments progress, is proving one of the largest ore bodies in existence. Mr. Murphy commenced work on the croppings to east of all the other workings and found black metal distributed throughout them. Mining men of large experience were here during the week and visited this property, pronouncing it among the best in the State. The future, from present appearances, is certainly very bright—in a pecuniary point—for the owners. The Centennial is now all the talk here in Grantsville.

LEWIS DISTRICT.

STARR-GROVE.—Lewis *Herald*, Feb. 8: In the Starr-Grove mine, the Clark incline has been sunk 59 ft. The Bothwell winze in the south level sunk 21 ft and the south lower level advanced 28 ft during the month of January. There is an 8-ft ledge of ore that averages $74 in the Bothwell winze, with well-defined walls. The chimney of ore has also been struck in the lower level south, and is opening up big.

CHLORIDE.—The tunnel on the Chloride mine has been advanced 52 ft during January. The ledge looks better, but not solid yet, though the walls are well defined.

BETTY O'NEAL.—The new find in the Betty O'Neal still improves as opened up. Stopes are being opened and a winze sunk which will expose a large body of ore.

SUN BEAM.—The winze from the lower level of the Sun Beam mine is down 63 ft. The width of the ledge is not known—no crosscut yet having been made. The ore is of good quality, resembling the Morning Star ore.

MORNING STAR.—The Morning Star mine still holds its reputation as a bonanza. Capt. Dahlgren was greatly surprised at the improvements made during his absence by his able foreman, Mr. J. Kennedy. We are informed that the management will have from 50 to 100 tons of ore worked as soon as the ore can be packed from the mine to the forks of the canyon.

OPHIR DISTRICT.

ATTRACTING ATTENTION.—Reese River *Reveille*, Feb. 4: Old Ophir mining district, situated in the Toiyabe range of mountains, some 50 miles south of Austin, in what is known as Ophir canyon, is attracting considerable attention in mining circles. Within a few weeks past two parties, representing capital, have made a thorough examination of the mines there, and especially the Forlorn mine, which has a U. S. patent, and is owned by A. Lognoz. The latter named mine was originally located in 1863 by Murphy and others, and known as the Murphy mine, which produced its millions in silver. On the strength of the richness of this mine a 20-stamp mill was built and run for some time. Quite a flourishing town was kept up during the time. Like many other mining towns in Nevada, Ophir, after a run of three or four years, was almost entirely deserted, caused by a break in the ledge and more water in the mine than the machinery was able to handle. The mill, hoisting works, etc., were finally taken down and moved to other districts. Some years subsequent to which, A. Lognoz relocated the old Murphy mine, and secured a U. S. patent to that and another location, and for several years has been to work on these properties extracting ore, which he has had worked at the Manhattan mill. The first-class ore yielded over $300 a ton. Altogether he has done well, and is still taking out high grade ore. He is now in a fair way to sell his interests in Ophir canyon to capitalists for a good round sum. Should the sale be consummated, and necessary machinery erected to work the mine, that district will be heard from in a few months.

PUEBLA DISTRICT.

THE PUEBLA COPPER MINE.—*Silver State*, Feb. 11: J. C. Wear, of San Francisco, is the owner of several copper mines out in the Puebla district, northwest from here. There is said to be large quantities of sulphuret ores in sight in some of the mines, but they are not worked, as such ores cannot be reduced at the mines, and the distance from the railroad makes it expensive to ship them. In one of the mines a brownish ore is found which, it is said, can be readily smelted in a water-jacket furnace. Mr. Wear, who has been in San Francisco for some time, has shipped here a rock breaker, a turbine wheel to run a blower, and other machinery for a furnace which he is going to erect at the mine for the purpose of smelting the ores.

ARIZONA.

ALTA.—*Pinal Drill*, Feb. 11: Far up above this cluster of mines, 4,200 ft above sea level, is the Alta, which was located in 1881, by White, Goodfellow and Vernon. There has not been much work done in it, but the vein is clearly exposed in an open cut, or short tunnel, a short distance from the prominent outcropping. There is a considerable quantity of this ore in sight, and the Alta bears all the indications of being a mine. We draw attention to these locations, prompted thereto by the constant inquiries that come to us from the various cities on the east of the mountains wishing information concerning mines and prospects surrounding the Silver King, of Pinal. There are many others that deserve mention, and which, from time to time, we will describe, as fast as we can visit them.

OXFORD AND DOVER.—The tunnel in the Oxford is now 50 ft long, and shaft on the Dover 42 ft deep. At 50 ft they will run a level, on the vein, towards the Oxford, and also sink to another 50 ft, when another drift will be started in the same direction. The Queen is extracting good ore and constantly improving. Mr. Scott is now superintendent of the Wideawake Co. Work is shortly to be resumed on the Lewis mine, the property of the Lewis Con. Mining Co. Work has commenced on the Pilot on the Josephine ledge. It is owned by Messrs. J. O. B. Gunn and John Champion. Great activity exists in the Mineral Hill camp. We are constantly receiving rich specimens from new strikes and splendid ore from lower levels.

PECK.—Prescott *Courier*, Feb. 4: We learn from what we believe to be a reliable source, that all the claims which have heretofore interfered with the working of the Peck mine, have been amicably adjusted, and that there is not now a single case against the Peck Mining Co calling for the action of the courts. The adverse claim against the Peck mine, which involved the title to some hundred ft of ground, has, we understand, been withdrawn with the others. Now that litigation over the mine has ceased, there is no longer any good reason why it should not be worked as in former years, and contribute its quota to the prosperity of Yavapai county.

ELLSWORTH DISTRICT.—Cor. Yuma *Free Press*, Feb. 10: Some new and valuable mines have been found and the old mines are developing beyond expectations. The Socorro, belonging to the Oro M. & M. Co., is turning out high grade ore, and the whole lodge will mill at a good profit. The main shaft is down about 50 ft and the ore is steadily improving with depth. The Oro, which is the property of the same company, looks extremely well. At a depth of 65 ft water has been struck in the shaft, which was something surprising to every one, but gives new life to the camp, as we can now calculate on an abundance of water for hoisting and reduction purposes, without expense of transportation. So far the ore below the water line is free milling, containing an exceeding small percentage of sulphurets. Developments in the Yellow Jacket mine are creating a great deal of excitement, uncovering a body of ore as fine as once would care to see. The shaft is down 25 ft showing a 3-ft ledge gradually widening with depth. The Good Luck is another mine which is coming in the front and will, in time, show we have silver as well as gold ledges. The ledge is large and assays well in gold and silver. We have so many mines here that it is impossible to mention them all in the brief space of this or any reasonable letter. In fact there is no place in Arizona where there are so many, and when capital once takes hold of this district it will prove to be one of the leading ones of Yuma county, and even the territory. The whole camp is busy and all are doing their best without waiting for capital or any man to do their work.

GOLDSMITH.—Dos Cabazas *Gold Note*, Feb. 4: The Goldsmith mine, belonging to C. W. Barrows & Co., situated at the west end of town, bids fair to make a good mine. The shaft is down 50 ft with well-defined walls of slate and ledge, average 2 ft wide, the assays running as high as $120 in gold and $20 in silver. Work has been suspended on account of water and will be resumed again as soon as the necessary pumping and hoisting machinery can be had from San Francisco. The Pepper Sisters mine, belonging to the same parties, situated also at the west end of town, shows flattering prospects. They have a well-defined vein of 3 ft in width that assays well in gold.

TOMBSTONE DISTRICT.—Tombstone *Epitaph*, Feb. 13: In the Old Guard they are prospecting and clearing up the mine. An upraise on the pay streak along the footwall 30 ft northeast of the shaft on the 90 ft level is in splendid ore.

VIZINA CON.—The drift on the 420 level is now in 109 ft. The drift running west from the Sumner drift is now in 50 ft in ore of good quality. Sinking winzes on this level, which is now down 12 ft in porphyry and low grade ore. The other drifts and stopes are looking as well as usual Raising and shipping about 20 tons a day. The Yreka shaft is down 54 ft, still in hard cement.

BOB INGERSOLL.—Drifting in ore on the 300 level and sinking on the winze from the 73 level, connection from which will be made with the old main shaft of the Blue Monday recently conceded to the Bob Ingersoll.

GIRARD.—Before our report the shaft of this company will be at work. Should the quicksilver arrive today, as expected by Supt. Woods, the stamps will probably drop on ore on Monday.

WORONOCO (San Diego) M. Co.—Main shaft down 347 ft, having made 7 ft last week. South drift on the 266 level carbonate still holds, and are sacking the ore. The ledge has widened to about 4 ft; made 10 ft in this drift during the past week. Taken as a whole, the mine looks quite as well as at the last report.

RICHMOND BASIN.—*Silver Belt*, Feb. 14: All miners at Richmond Basin are steadily at work. Joe Brewster, in that immediate neighborhood, is sinking a 100 ft shaft on his Dundee mine, and when completed will drift on the ledge. O. W. Sharp is taking good ore from the Victoria mine. Risbridger, Campbell and O'Neill are working assessments for 1882. Mack Morris, besides stoping on the 400 and 500 levels, is deepening shaft to 600 ft.

COLORADO.

MINING IN PITKIN.—*Mining News*, Feb. 11: The most important occurrence to our camp took place last Monday, and was the signing of a contract by Dr. Vance with a friend residing in Missouri, who is a well-informed gentleman, with sufficient capital to carry out the enterprise. The contract is for a 10-stamp mill, to be erected as soon as it can be freighted to this point. The contract signed is a perfect and very important paper, and settles the matter of a mill for the Gold Belt. The agreement is briefly noted as follows: "Dr. Vance has deeded to the party mentioned a half interest in all of his mines in the district, in lieu of which the doctor becomes a half owner in the mill and will assist in its operation." Among the properties mentioned in the transfer were a third interest in the celebrated Wonderful and a half interest in the noted Dodson extension, 2 of the richest and best mines in the entire district. The gentleman from Missouri has made a splendid and safe investment which we are sure he will not regret. The mill will be erected on Spring gulch, three-quarters of a mile above the Sultana crusher, and will be accessible to all the principal mines of the Gold Belt.

IDAHO.

COMING IN ALREADY.—Wood River *Times*, Feb. 8: Four prospectors came in on the Blackfoot stage last Monday, from Colorado. They will make their headquarters in Hailey, so as to be in sight of the mountains where they intend to prospect next summer. They say that there will be a large immigration here from Leadville and other Colorado camps this spring. Quite a number of men who prospected on Wood River last summer have already arrived, or are on the way in.

WORK RESUMED ON LITTLE WOOD RIVER.—Wm. Thompson, an experienced mill superintendent, miner, and prospector, has gone out to Little Wood River, to take charge of the Solid Muldoon and other property of the Little Wood River Mining and Smelting Co. Mr. Thompson left Hailey yesterday, with 4 miners, he having come to this place for a bill of goods. He will add to the force at work as soon as he can find room for men.

THREE HOISTING WORKS IN THE COUNTRY.—The Mayflower hoisting works were started up a few days ago, and are running smoothly. This makes the third hoisting works in this section, the other two being at the Bullion and Ornament mines. By spring, the Eureka, Jay Gould, and other mines will doubtless also have hoisting works.

NORTH STAR.—Idaho *World*, Feb. 10: The boys have struck it big in the North Star, on Shaw's mountain. The tunnel that tapped the ledge a few weeks ago disclosed two seams—the one on the foot wall 3 inches wide, and the hanging wall seam a foot in width. A drift is being run east from the tunnel. In the face of it, 20 ft from the tunnel, the seams have widened to 5 inches and 3½ ft in width, respectively. Mr. Plowman is of the opinion that the ore of both seams will mill between $10 and $20. Chunks of sulphurets weighing 400 or 500 lbs. have been taken out. The vein is about 5 ft between walls. No one in Boise county has exhibited more pluck and perseverance in delving for quartz than has Plowman. It now looks like he will be liberally rewarded.

MAMMOTH.—Four men are at work in the Mammoth mine, on Summit Flat, owned by Hon. Ben. Wilson and Henry Whitney. They are raising chutes. One reached the surface a few days ago. It was run up 250 ft. Two others have been started up. After completing the chutes the mine will be opened in new places. A tunnel has been run a thousand ft—300 to tap the ledge, and 700 on the vein. The vein varies in width. In places it is 12 ft. wide. Every foot that has been worked has paid. The mine has not been stoped for more than 150 ft in length, so there is an immense body of ore above the tunnel yet to be mined. Mr. Whitney tells us there are 2 or 3 other good mines on the flat, 1 the Goodwin mine. It was worked several years ago and paid well.

MONTANA.

SUMMIT VALLEY NOTES.—*Inter-Mountain*, Feb. 14: The Box fire box, which has been in use in the Silver Bow mill for some time, is giving satisfaction. The Silver Bow mill is again running to its full capacity. The four Butte smelters are shipping daily large amounts of matte and black copper. The ore body in the Bell of Butte continues to gratify the owners, and is producing a steady supply of good ore. Some magnificent specimens of wire silver were taken out yesterday. In the La Plata the work of development continues, and the expectation is that in a short time a fine ore body will be tapped. At the Modoc the shaft is now down some 130 or 140 ft, and within the past day or two a well defined and fine vein of copper silver ore has been struck, more promising than anything yet reported in the mine. The ore recently struck is said to go 50 per cent. copper and is shipped immediately for reduction. In the Morning Star work is being prosecuted actively in the west drifts of the 100 and 200 ft levels. On the lower level the face of the west drift is in 225 ft. On the upper level a very rich ore body showing native and wire silver in considerable quantities, has been developed in the past 48 hours. The Magna Charta now shows an activity that is really remarkable. Just 1 week ago Thursday, work was begun sinking the new or east shaft. The material encountered was granite, some of it quite hard, yet in spite of this in 7 days the new shaft had reached a depth of 50 ft, progress unprecedented in the annals of Butte mining.

THE ST. LAWRENCE.—The copper-silver ores of this district furnish a strong title to the claim that its prosperity will continue to increase steadily. The St. Lawrence is a mine recently opened up, and shows a fine body of copper-silver ore. On the 100 level a body of ore 8 ft wide assays 29 per cent. copper. On the 225 level the ore body is 25 ft wide, and of this 16 ft give an average assay of 46 per cent. copper. On the 525 level the vein is 50 ft wide.

THE MOULTON.—Mr. S. H. Macumber has a large force of men now at work day and night completing the setting of the new Cornish pumps. The work will probably be done by the middle of the current month, and in the magnitude of the machinery used and the complicated system of operation surpasses anything heretofore known on the Pacific coast, outside of the Comstock. When this is done the 400 and 500 levels will be thoroughly developed. At present and for the past week work in the mine has been confined to the 200 and 300 levels on the center vein. The east drift on the 300 level is to the Alice ling; here raising and stoping are going on. The connection between the 200 and 300 levels is nearer the crosscut. The west drift on the 300 is in 250 ft, and from this point a crosscut is being run south for the main vein or grade ledge, struck in grading for the mill. A raise is also being worked here to the 200 level.

THE MOUNTAIN CONSOLIDATED.—The Miners' prospecting engine which is still used in the Mountain Consolidated hoisting works continues to do good service. The shaft is being sunk steadily day and night, and has now reached the depth of 140 ft. When an additional depth of 85 ft is reached, a crosscut will be run to the main ledge.

THE CLEAR GRIT.—The Clear Grit shaft is now down about 135 feet, and work is being pushed vigorously sinking it further.

NEW MEXICO.

ABBEY DISTRICT.—Socorro *Sun*, Feb. 12: There is no mistake but the boys have a good thing in the Abbey district, in the Caldonas Yesterday we saw on exhibition at Young's store a specimen from the shaft now being sunk at the intersection of the Aurora and Little Abbey mines, weighing 80 lbs. The prospects of the mine are seemingly as good as any in those mountains. The boys have commenced tunneling in on the vein. Neither wall has been found and they are unable to tell the width of the vein, but it is very large. There are about 35 prospectors in the district.

BLACK RANGE.—Judge Adams is working 3 8-hour shifts on the Alaska mine, and it is understood that he will run the shaft which is now down about 200 ft, to a depth of 500 ft before he stops. This company has now about 900 ft of work on their different properties. The Buckeye and Braxton mines are working double shifts. On the new belt, on the head of the South Fork, there are several men working with good results, and the indications are that some of the best property in the range will be developed on this belt. Considerable excitement prevails in the Cuchillo Negro mountains over recent rich copper discoveries in that range.

MIMBRES M. CO.—*Silver Brick*, Feb. 6: During the year just closed the enterprise of the Mimbres M. Co. has been manifested in a manner highly creditable to the management, as will appear from the subjoined statement: The average number of men employed during the year was 250. The pay rolls exhibit a monthly expenditure for wages of $15,000. The sum of $80,000 has been expended in permanent improvements. The amount of bullion shipped amounts to 170,000 ozs. One and one-half miles of openings have been made in their mines. Additional ground has been added to the original purchase. Two large buildings have been erected at the mine. The shipments of bullion have been constant, and aggregate to the amount above noted. The company's works have also produced a good showing of bullion from ores mined at the McGregor, Commercial and Satisfaction mines, which has been shipped by the parties owning the ore.

BULLION.—*New Southwest*, Feb. 14: The Adams Express Co. shipped for the Mimbres M. Co., this week, 6 silver bricks, having a total weight of 334 lbs., valued at $8,250.

OREGON.

WOLF CREEK.—Jacksonville *Miner*, Feb. 10: A company of gentlemen from abroad styling themselves the Pacific M. Co., has become possessed of some excellent ground on Wolf creek, and have let a contract for digging quite a long ditch to the Chinamen recently taken down by Wm. Eaton and P. Boschey. H. B. Morse is the superintendent.

LIGHT YIELD.—Few miners have done comparatively anything, and unless they have a favorable spring, the yield of gold dust will be much lighter than usual. Some have been able to do a little work late in the day, with the aid of reservoir heads, but the prolonged cold snap has generally prevented any extensive operations.

BREAK.—Ben. Haymond, of Rock Point, who was in town yesterday, informs us that the damage resulting from the break in Hays & Magruder's reservoir, last week, including loss of time, amounted to about $1,000. Wm. Ludington, who has charge of the mine this season, lost no time in making repairs, however, and operations have already been resumed.

WATER.—Snow, intermingled with rain, commenced falling Wednesday morning, and continued until yesterday noon, when it started in raining earnestly. This has furnished the miners a fine supply of water and they are making the most of it. A little snow still remained on the ground as we went to press, but was melting rapidly. The prospects for a fair season are good, unless cold weather should again intervene. Jacob Klippel & Co., of Poorman's creek have been sluicing a few hours each day with the aid of reservoir heads. A. W. Sturgis & Co., of Jackass creek, have resumed drifting, as there was hardly enough water for ground-sluicing at the time. The miner is happy in anticipation of a change for the better, since the weather broke, and still hopes to make a good run this season. The Applegate Gravel Co.'s elevator, received last week, will be put into position as soon as the weather is favorable. Pfeil Bros., of Quail's creek, have struck some very good prospects and they believe that the rich channel of olden days has been found again. We hope so. W. S. Brodbeck and Lannee Klippel, who have a claim on Dividend Bar, came to town Wednesday. From them we learn that the cold snap caused a total suspension of mining operations.

Locating Mineral Veins.

A Clear Statement by an Arizona Judge.

In his charge to the jury in tbe Contention Head Center suit, recently decided at Tombstone, Arizona, Judge W. H. Stilwell said:

Mining law was made for miners. It ie plain and simple. It provides that a mau or a number of men may make a location of certain mineral lands, after they have found a mineral vein, lode or ledge. You have listened to the testimony of miners of great experience, and of men learned in geology. Yon may find some difficulty in coming to your verdict to reconcile all the testimony that you have listened to, and I will state hers that the mining law is simple and general. It would he difficult to give definitione, euch as yon have listened to, that can be fully applied in this or other cases. Therefor the definitions of words found in ouretatutee are very limited, in fact no definitions regarding a vein, ledge or lode. Courts must be careful of giving definitione of veins, lodes or ledges, and trust very much to the wisdom and good judgment of the jury, after listening to the testimouy, to find what is a vein, ledge or lode in the case they consider. Miners usually follow ore that will pay, or what they thiuk will lead them to ore that will pay to mine. There are many little seams, as you have heard testified to, running out from large bodies of ore. Some may pay to follow and eome may not. What there is of them may he pure, rich and valuahle, and yet not pay to follow, aud I will add that some of the testimony that you may have listened to, as a matter of science, may he clear in logic, rich in learuing, hut as miners it may not pay you to undertake to reconcile all the facts or opinions that you may have listened to hefore fiuding your verdict. You are at liberty to consider such part of the testimony as will enahle you to arrive at the facts in the case. It will he quite impossihle for you in this case to reconcile all the testimouy I have illustrated, though as a matter of science the fine distinctions and definitions you have listsned to may he true and interesting. A lode, vein or ledge, so far as eatisfying the law is concerned, may he defined as a mase or hody of mineralized or metalliferous rock in place, surrounded hy other different rock. That is ahout all the definition that I feel can he given from the hench that will apply to many different cases.

I am of the opinion that the coloring on the map, takiug these three long epots, are in the meaning of the law, in place. Yet you had testimony hefore you that they are not where they originally were—that they had heen faulted and moved. The mineral, we were told, is not where it wae wheu the vein, lode or ledge was formsd, yet they are in place. By rock in place, we mean rock that hae not heen changed hy the elements or gravitation. In coming to your decision as to what is a vein, if you find that there is one here, and whether it embracee the entire porphyry dike, or, simply, as is claimed by the defendants, the mineral embraced within clay selvages, which they call walls, you are at liherty to consider the formation of those other veins, lodes or ledges in the Contention mine. If you are convinced that those veius were formerly one vein, but have heen faulted and eeparated hy forces in the earth, you may consider and compare them as to their general formation. In passing npon this vein, ledge or lode, it is for you to say what is the houndary of it and of what it consists. If yon come to the opinion that the vein, ledge or lode is simply that described hy the defendant, then in making the lines, as I shall hereafter instruct you, you must be guided as to where that vein courses or takes its strike. If you come to the opinion that the porphyry dike is the vein, you shall he guided by the size of thet and the strike it takes, in plecing those lines ahout which I will instruct you.

Flesh Worms on the Face.—The hlack points, flesh worms, technically termed comedones, which are found in the face, and especially near the noetrils, are not at all produced hy the accumulation of the particles of dirt or dnst, ae has generally heen hslieved, hut hy pigmentary matter which ie eoluhle in acid. It is known, in fact, that hlack comedonee which accompany and often appear not only on pereone exposed to duet, or rather careleee of their pereon, hut also on chlorotic youug girls who live in good circumstances. Besidee, obeervation ehowe that the diecoloration not only exiete on the surface of old comedones, hut descende alwaye to the lower parts. Accepting thie fact, Unna has ueed euccesefully acide in the treatment of comedonee. He generally prescrihee: Kaolin, 4 parts; glycerine, 3 parts; acetic acid, 2 parts, with or without the addition of a emall quantity of eome ethereal oil. With thie pomade he covere the parts affected in the eveuing, and if need he during the day. After eeveral daye all the comedonee can he eaeily expreesed, moet of them even come out hy washing the parte with pumicestone eoap. The eame reeults can he ohtained hy handaging the parte affected for a long time with vinegar, lemon juice, or diluted hodrochloric acid. The anthor concludee hy eaying that the acids act like coemetice, ae they transform the hlack color into a hrown and yellow ehade and destroy it gradnally altogether; they produce a quicker deequamation of the horny hed which intérrnpts the exit of the cnmedonee and hringe to the eurface the glandular openinge.—*Archives de Virchow.*

Electric Light on Railway Trains.

A correspondent of a Sheffield (Eng.) papsr, writing from London of the recent trial of eleotric lights on the Pullman train of the London, Brighton & Sonth coast railway, eeys:

There ie no douht whatever on the point that thie, apart from the question of cost, ie a decided euccess. It is easily manageable, and diffnses through the train a pleasant, equable light, scarcely less agreeahle than daylight. It is turned on and off with instantaneoue effect ae the train enters and leaves a tnnnel, aud of course is kept hurning the whole of the time duriug the night journeys. The electricity is etored in a numher of lead plates, which are kept in water in iron hoxee in the gnard'e van. There are two lots, one at either end of the train, and two mechanics in charge of them. This discovery of ahility to etore electrioity for application to lighting purposes seems to carry the discovery further than anything since it was introduced. It gets over many difficulties which seemed insuperahle—especially the important one of the great waste of power which is illustrated every night at the Savoy theater—and would he applicahle to the intrndnction of electricity for household use. At the Savoy, when the exigencies of the play require that the lights should he turned down in the auditorium, there is no cessation of the enormoue power required to produce the full effect. What happens is that, hy a mschanical contrivance, the electricity is carried off from the light and goes to waste. With this system of etoring, electricity can he used just like gas, as much or as little as people chance to want. Another great advantage is the freedom from jumping inseparahle from tbe action of the driving power of the steam engine, or of tbe motion power of water. The lights on the Brighton train hurn just as eteadily es gas, an effect not in any way ohtained where the light is maintained directly hy the driving power of steam. But, after all, the question of gas vs. electricity will resolve itself into one of cost, and it is here where gas will inevitahly hold its own. The fundamental principle of the electric light is, that for a given exertion of power you obtain a given proportion of light; neither more nor less. For every hour it is hurning, there will reqnire a certain exactly-ascertained proportion of revolntions of the steam engine, and therefore, if the whole town is lighted, it can be done only at a strictly proportionate expenee to the lighting of a eingle house. Asto what that expense will he as compared with gas, the Brighton train would, if we had an idea of the actnal figures, afford a precise means of information. I met on the train a well-known gas engineer, attracted, like myself, hy the novelty of the experimeut. What the electric lighting cost, he was not able to say; but when we take into account the capital eunk in plant, involving a steam engine with the necessary huildings, consumption of coal and necessary employment of skilled labor, it must he eomething considerahle. Against tbis is the hare fact tbat the Brighton train could be lighted with gas for the douhle journey at tbe cost of 10d. It is a physical impossibility that electricity should ever come anywhere near this, and that prohahly explains the eingular phenomenon, that at the time when electricity ie making many conspicuous advances in puhlic favor, the value of gas shares is not only steadily maintained, hut is actually rising in the market.

Native Silver in Iron Ore.

At a recent meeting of the Anstrian Society of Engineers, specimeus of native silver were shown which occnr under peculiar circumstances on the east coast of Spain, in the province of Almeria, Las Herrerias, near the Mediterreneau. The Phœuiciane and Romans mined in that locality, hnt prohahly stopped work during the fifth century. Mining now is almost entirely confined to a hill ahont 100 ft. high, consisting almost entirely of iron ore, a hematite more or lese mangauiferons. Through it run several veins of heavy spar. Along the northern, eastern and sonthern parts of this hill, which stretches toward the north for a distance of ahout 5,000 ft., the iron ore is covered hy a hed of marl, the so-called *laguena*, which has a thickness ranging between 160 ft. and 500 ft. Below the marl, and ahove the iron ore, is a bed of "flint" ahont 1.5 ft. thick. In placee tbie flint ie fissured and then forme rounded fragments, which have the appearance of having heen acted npon hy long rolling in water. In the northeastern part of the marl are eeveral hede of galeua, low in eilver, which are called *mantos*. The latter have heen worked for 40 years, no one having a suspicion of the rich eilver oree lying helow them nntil that metal was diecovered in the layer of flint. The eilver, which ie generally native, occure more frequently in the heavy epar, and ie occasionally found, too, in the iron ore proper, eepecially wben it ie lower in manganeee. The texture of tbe eilver is peculiar, it having a eandy appearance, and this, comhined with the rounded shape of some of the fiint, led to the idea that the whole might poeeihly be the result of the destructiou of dietant veine carried to the preeent eite hy water. Againet thie theory of an alluvial depoeit, it ehonld he noted that the vicinity ie croseed hy many dykee of trachyte and hasalt. The marl contains ehelle and the teeth of fieh helonging to the miocene, the former often showing a crust of galena.

A Strong company hae been incorporated to develop and work the Red Rover mine, Calico district, San Bernardino county.

Mills and Smelters to be Started up During 1882.

There are now in operation in this district (Butler, Montana), the following mills: Alice, 80 etamps; Silver Bow, 30 stamps; Lexington, 10 stamps; Dexter, 15 etamps; Moulton, 40 etamps; Clipper, 5 stampe. Of emelters, there are in operation the Montana and Colorado, daily capacity, 18 tons; Montana Copper, daily capacity, 50 tons; Parrot, daily capacity 50 tons.

Dnring the year just hegun, the following enterprisee will he etarted: Two 40-etamp mills hy the Lexington Co., one of which is now rapidly nearing completion; a 20-stamp mill hy the Clear Grit Co.; a 25-ton emelter hy the Sheridan Gold aud Silver Mining Co.; a 20-stamp mill by the Stevene Co., and, in all likelihood, mills for the treatment of ore from the Anselmo, Salisbnry and Anaconda. It is also in contemplation to huild a 40-stamp mill to treat the product of the Monntain Con., which property hes just heen incorporated. The ownere of the Gagnon will certainly he disregardful of their hest interests if they longer delay the erection of a emelter. They have already paid out an enormous fortnne to have Gaguon ore treated, and now that a decision of the U. S. Supreme Court has given tbem a clear title to the property, and that the ore is richer and more ahundant than ever bsfore, tbere is every reason to helieve that Col. Thoruton and his wide-awake partnsre will proceed at once to make arrangements for the building of a 50-ton smelter.

On the day of this issue of the *Holiday Inter-Mountain*, or a few days thereafter, the 50-ton smelter of the Bell Mining Co. will be fired up on the product of one of the hest minee in the western Territories. A description of mine and emelter will he fonnd in another column.

In addition to all the uew enterprises contsmplated, the capaoity of the works already established will he very largely increased. At the smelter of the Colorado company two etacke and a 50-ton concentrator will he fired up. They will double the capacity of the works, and will ewell tbe outpnt next year to fully $2,000,000. Four new furnacee are being erected under the roof of the Parrot company's smelter, and extensive improvements are contemplated at the Montana copper company'e worke. W. A. Clark etates that in the early spring it is his intention to add a roaster to the Dexter mill, by which means tbe treatment of hase ore will he possihle. It ie also authoritatively stated that the bnilding in which the Howland pulverizer now lies emhalmed will he fitted up as a 10-stamp mill.

From the foregoing incomplete account of the enterprisee to be started in thie camp next year, all people who have not enjoyed a trip to the Silver City and who are desiroue of securing a new home where they can permanently and profitably reeide, can gain an understanding of the extent of the hoom wbich will strike this camp next summer—the greatest, richest, and most productive mining district of the world.—*Inter-Mountain.*

Boundaries of Mining Claims.

In his charge to tbe jury in the Contention Head Center suit, at Tombstone, Arizona, Judge Stilwill said:

"Regarding the locetion of miniug claims, to make a location, a miner is not compelled or permitted, until he finde a mineral-bearing vein, ledge or lode, and until he is fully setisfied as to its course and strike, tbat he may locate the claim conformatory thereto. If tbe location is made hefore the etrike of a vein is or can be ascertained, the principle that the law does not require an impossihility, cannot he nsed as an excuse for following a vein after it materially departs from the exterior houndaries of a mining claim and does not return to it. A man may locate a mining claim, if he chooses, hefore he learns the true strike of his vein or ledge; and the law providee what minerale he may extract therefrom. If he makes a mistake in bis location, he cannot he excused on the principle that the law does not require an impossihility, and he permitted to follow hie vein or ledge hefore it strikes out heyond the side boundariee of his claim. He mnst abide hy what the law saye ie embraced in the honndariee of his claim, and ahout which I will more particularly instruct you. In thie caee, I inetruct you that it is your duty to give to the plaintiff all that you would coueider him entitled to if the property claimed hy the defendant helonged to the United Statee. That ie to say, if I locate a farm, the houndary of my farm ie not different by reaeon of the fact that the property adjacent may helong to the United Statee, or any individual; and I am of the opinion that if the property helonging to, or claimed hy the defendant, helonged to the United Statee, the plaintiff would have no right in law to go any farther heyond their eide linee than they have in thie case. If the defendants are *bona fide* enhsequent locatore. The law provides that the location shall he made euhetantially parallel with the etrike of the lode or vein, and that the end linee shall he parallel. It ie eo difficult to do thie in all casee, that if the line or rim entere the claim at one corner under the end line and croesee diagonally through the claim and ont under tho other end line, it ie held that the location ie good, and the owner of the claim cannot he dieturhed, and may follow that vein downward in ite dip, to any extent, even though it ehould so far depart from a perpendicular in ite conrse downward ae to extend onteide the vertical eide linee of euch surface locations.

The Demand for Zinc Ores.

There is a large demand at present for zinc ores from smelting works in New York, Philadelphia, Bergen Point, N. J., and other portions of tbe Middle States. For many years zinc mining has heen prosecnted extensively in New Jersey, Penusylvania and various portions of the South and West. With the increasing metal demand which ie the outgrowth of the wonderful busineee prosperity throughout the country, zinc has received ite proportionate ehare; and as new uses have been discovered for this valuable and indispensahle metal, the demand has become enormous, leading to a remarkable appreciation in prices. At the same time the supply has been much decreased by the reduction in output of ore from many of the minee which formerly oontrihuted very largely. It is understood the zinc mines of New Jersey and Pennsylvania are becoming exhausted, and that it will he necessary in the future to look elsewhere for these ores. The smelters have accordingly turned their attention tbis way, and numerous representatives have visited the mineral fields of Maine and made thorough and exhaustive examinations. These parties will buy zinc oree directly on the dumps, and will pay haudsome prices for large quantities of these ores. One of the large smelting works, we are informed, has already changed over their emelters especially to treat Maine zinc ores, and it is reported if encouragement is offered a large firm will remove the scsue of their operations and erect costly and elahorate zinc works at some desirable location in our own State. The Lsbigh Zinc and Iron Co., of South Bethlehem, Pa., John Price Wetherell, manager, are operating a mine on Cutler Head, Washington county, for zinc. Day and night crews are heing employed; the shaft has reached a depth of ahout 40 ft., and the prospects are excellent. It is prohahle that a large number of outside companiee will visit our State and mine the zinc deposits which exist in many of the towns along the cosst of eastern Maine. The appreciation in value and large demaud for zinc ores will eurely very materially advance our miuing interete and he of great aesistance to many of the mines now being actively worked. In openiug our mines much ore has been encountered carrying large proportions of zinc, and thie has in the past heen considered practically worthless; hut now this ore at once comes into prominence, and it ie found that it bas considerable value. There is no reason why many of our mining propertiee cannot he opened and thoroughly developed, enough heing received from tbe sele of zinc ore to pay all expensee from the grass roots. This ie a most encouraging feature for the Maine mining interests.—*Maine Mining Journal.*

Bronzing Zinc.—Good results are said to he obtained from thie metbod of ooppering and hronzing zinc: Prepare a solution of 15 parts of hlue vitriol, and one of 19 parts of cyanide potassium, and mix them hoth together. Incorporate this liquid well with 160 parts of pipe-clay, and ruh the resulting semi-fluid, hy meane of a linen rag, on the previously cleaned ohject. For hronzing, take 15 parts of verdigris, 19 parte of cream of tartar and 30 ot crystellized soda; reduced them to powder, and dissolve them in the necessary amount of watsr. Mix this liquid with 160 parts of pipe-clay, and then proceed as ahove directed. This is another process: Take 15 grammes of hlue vitriol, 20 of celcined soda and 32 cuhic csntimeters of glycerine, and when these eubstances are thoroughly incorporated mix the paste thns ohtained with 80 grammes of pipe-clay. The mixture is to he applied as ahove described.

Effect of Antimony on Copper.—It bas heen found that the one-thousandth part of antimouy converts first-rate hest selected copper into the worst conceivahle, so had as to he fit for hrass only, and that one four-thousandth part rednces it from "hest eelected" to "tough ingot" quality, and one sixteen-thousandth sensihly deteriorates the copper. It has, moreover, heen found that one-thousandth pert of nickel, cohalt, hismuth, arsenic or phosphorus, reducee "hest eelected" to "tough ingot," while nickel and arsenic in comhination and mixed in the proportion of one five-hundredth, make copper unfit for brass, thus ehowing that two eubstances in comhination may produce a far more hurtful effect than either of them separately.—*Iron Age.*

To Gild Steel.—This metal may he gilded hy means of a eolution of gold in ether. To do this a quantity of gold ie diesolved in nitro-muriatic acid, and then boiled until the liquid evaporatee, when the residue is diseolved afreeh in water, to which is added three timee ae much eulphnric ether. The liquid is then left for 24 houre in a bottle, tightly corked, after which time it will he eeen to float on the eurface of the water. If the eteel ie then dipped into it, it will hecome gilded immediately, and if deeigne have heen painted on the surface of the metal with any varnish, a heantiful epecimen of a eteel and gilded eurface is ohtained. For other metale the galvanic procese is employed.

The Gold Hill *News* of Feh. let eaye: There ie a new engineer at the Alta. The one on ehift yeeterday afternoon ran the cage into the eheavee. Denis Callahan, the pumpman, wae on the cage, but he jnmped off, catching on the croee hars of the gallowe frame. He eaved hie life by hie presence of mind.

The Engineer.

Wonderful Ocean Steamships.

We have already made a brief allusion to a new mode of constructing steamships which has recently been proposed. We now give the following more particular description from a late number of the Boston *Transcript:* A wonderful story, beside which the narrative of the adventures of Sinbad, the Sailor, is dwarfed into nothingness, is that told to a New York reporter of the wonderful steamships to be built on the Hudson for ocean traffic. In the first place, the ships will have no maste, and therefore, all "top hamper," such as spars and sails, will be dispensed with. The first boat, which it is expected will be launched before the first day of next May, will be 147 ft. long, 21 ft. beam, 16 ft. deep, with 5 ft. 3 inches draft forward, and 11 ft. aft. The peculiar feature of her construction will be, that her deck will be completely domed, nothing being in sight but the upper portions of the pilot-house, smoke-stacks and ventilators. The pilot-house will be entered from below, and, being made of convex glass an inch thick, set in steel framework, will give an unobstructed view in all directions. The advantage claimed for this invention is, that the amount of obstruction to the wind and waves is reduced to a minimum. The machinery will occupy less than half the room now required on most steam vessels, and its weight will be one-third less, but its power will be more than five times as great as that now in use. The saving in stowage and weight will be made by using steel for the construction of every portion. It is calculated that the boilers will withstand a pressure of 1,000 lbs. per square inch, with a working pressure of 650 lbs. to the same surface. But why go farther into the dry details of revolutions, and size of propellor blades and all the rest of it? The possible result is all that interests the general public. The claim is made that, aided by the dome and the thousand lbs. pressure, and the steel boilers and so forth, the run from Boston to Liverpool will be made inside of five days. Subsequent ships will be 400 ft. or more long, with other dimensions in proportion, and furnished with boilers which will store the power of 16,000 horsee, and never think of blowing up short of 1,000 lbs. pressure per square inch. The *Servia*, by the way, being allowed to carry from 90 to 120 lbs. pressure to the square inch, the unscientific reader will see that these new wonders of marine architecture will be something tremendous.

Extraordinary Disappearance.

The German Admiralty decided last year to erect a new lighthouse near the mouth of the Weser, in the open see. From the exposed position, the depth of water (26 ft. at low water), and the nature of the soil, it appeared expedient to sink the foundations by means of compressed air and concrete caissons. The lighthouse was to be erected on a single caisson, 44 ft. by 33 ft. in area, with a working chamber of the usual hight, covered with brick arches, and made tight by a layer of concrete 4 ft. 6 inches thick. The bottom part and casing, to the hight of 40 ft., were erected on land, and floated to their position, fitted with the boiler, engine, air compressor, and other working appliances. The sinking then began, and was continued till the 11th of October, when the bottom of the caisson was 70 ft. below low water level, or 44 ft. in the soil, the casing being then altogether about 82 ft. high, and the concrete inside having reached a thickness of 32 ft.

The work had to be interrupted at that date, the stormy weather making the conveyance of materials to the works impossible. The unfilled part of the casing was thoroughly stayed, and it was expected to withstand the winter's storms. The works had scarcely been left when a terrific storm broke loose. On the 13th the whole block disappeared at noon, in the space of about two minutes, a column of water shooting up after its disappearance. Approach was impossible till the 19th, when the report was found to be correct. The tower had completely vanished, without leaving a vestige of its existence in the shape of wreck behind it. By soundings' the bottom of the sea at the spot where the tower had been was found to be the same as before it was put down.

The cause of this remarkable occurence has not yet been satisfactorily ascertained. The soil last worked upon was firm sand, so hard that it had to be worked with picks. It is supposed that the sand did not extend much farther down, and had a substratum of hog, and that the tower, loosened by the shocks of the storm waves, had broken through the layer of sand and gravel, and been engulfed in the hog underneath. The weather has not yet permitted borings to be undertaken to ascertain the truth of this hypothesis. The loss caused is about $50,000, but fortunately no lives have been sacrificed.

The new ship canal which is to connect the Baltic and North seas, will save nearly 600 miles of the water journey now made around the Danish peninsula. The cut will be from Gluckstadt to Kiel, and the length will be about half that of the Suez canal, or about 50 miles. There are several small lakes lying in the way which will be utilized by the engineers, as was done in the case of the Suez cut. The work is to be undertaken at once.

Useful Information.

An Electrical Experiment.

A Cheap Toy, and Plenty of Fun for the Little Folks.

We sometime since published the following paragraph as something both curious and interesting.

"A curious electrical experiment is described in one of the French journals, as follows: A small pasteboard box is provided with a glass lid, which is coated on the upper surface with one or more thin layers of collodion, but not enough to render it opaque. A number of figures representing insects and the like, and made of cotton or sponge, are placed within the box. When now the collodion surface is rubbed with dry fingers in dry weather, the insects are made to move about in an interesting manner as they become electrified."

The Territorial *Enterprise* of February 7th, gives the following in the same direction, which will be found especially interesting to our young readers:

Over a year ago we published an account of this experiment. John S. Orndorf, of the firm of Orndorf & Adkison, book sellers and stationers, in wiping off boxes that had glass lids, discovered that particles of lint, bits of thread, paper and the like, flew up from the bottom of the box and attached themselves to the glass, moving about as though they were alive. Further experiment showed him that the same thing took place in the show-cases, when the glass of the tops was rubbed with a handkerchief, but on a larger scale. He made butterflies and other insects, some three inches long and two inches wide, of colored paper, also little balloons and a great many other things which, being placed in a show-case, performed in a really comical manner when the glass was briskly rubbed. The air here being dry and light, no collodion coating is required. The show-cases used in the experiment are eight or ten inches in depth, yet the artificial insects would readily hop from the bottom up against the glass and dart about from place to place. Often an insect would be seen to leave its place, swoop down almost to the bottom of the case, then rise and attach itself to the glass at another point, from one to two ft. away from where it had its first hold. Sometimes two or more of the insects would be seen to suddenly dart at one another, cling together and fall to the bottom of the case, as though fighting, and on touching the bottom of the case they would separate, and darting back take new places on the glass. When a lot of small insects made of the bright, artificially-colored mosses imported from Europe are used, the effect is very fine, and those who see the experiment for the first time can hardly be made to believe that the bugs, worms, butterflies and moths are not alive. The effect may be produced (in this climate) by laying a light of glass upon the lid of any ordinary paper box. The changes are almost as many and curious as those seen in a kaleidoscope.

How Artificial Teeth are Made.—The manufacture of teeth is a large industry. There are now 12 manufactories of artificial teeth, that produce every year 10,000,000 teeth, or one to every five persons in the United States. Half this number are made by one firm, founded in 1844. The total sales of teeth amount to $1,000,000 annually. The materials used are feldsper, kaolin, and rock crystal. The coloring is platinum, titanium and gold. The feldspar and cryetal are submitted to red heat and thrown into cold water. They are then ground in water until fine enough to float. Combined with the coloring, they are subjected to intense furnace heat in molds of brass, which are in two pieces, each molding one-half of the tooth. The process is delicate, and has many interesting details. In the earlier history of the art dentists carved the teeth which their customers demanded, and apprentices were often made useful in that way. The amount of gold used annually in filling teeth is $500,000. Lead was used from 1778 to 1833. There are dentists in New York who give, or say they give, diamond fillings, and in Paris they advertise to use diamond pivots and emerald plugs. The filling of teeth is aided greatly by labor-saving machinery and cunningly wrought tools. This country makes dental instruments for the world where dentistry is known. An ordinary outfit of instruments costs $500.

Preservative Paper.—Two new kinds of preservative paper have lately come into commerce in Europe. One is produced by dipping soft paper in a bath of salicylic acid and then drying. The bath is prepared by mixing a strong solution of the acid in alcohol, with much water. The paper is useful for covering apples, etc. The other paper, meant to preserve from moths and mildew, consists of so-called Manila packing paper, dipped in a bath and dried over heated rollers. The bath is formed of 70 parts spirit of tar, 5 parts raw carbolic acid (containing about a half of phenol), 20 parts coal tar at 163° F., and 5 parts refined petroleum.

Lighting Fires.—To avoid the disagreeable smoke and gas when a fire is lighted on a damp day, light a handful of paper or dry shavings on top of the coal before the fire is kindled. This produces a rapid draught, carrying off everything offensive.

Artificial Onyx.—Mr. A. Dreher has patented the following process for converting ordinary agate into onyx: The dressed stones are first placed into nitric acid, to extract the compounds of iron and other metals, then dried and calcined to remove the remnants of nitric acid. They are then soaked in a solution of 220 grains of caustic potash or soda in one litre of water until saturated, and washed in water. By placing them again in nitric acid and washing, the alkali is removed from the outer surface of the stones, after which they are dried and thoroughly calcined. The stones thus treated are completely bleached and white, while their outsides are rendered porous, so that they can absorb coloring solutions, which gradually shade off into white, as in natural onyx. They are finally engraved, giving colored reliefs on white grounds.

To Make Glycerine Leather Polish, mix intimately together three or four lbs. lampblack and one-half lb. of burned bones with five lbs. glycerine and five lbs. syrup. Then gently warm two and three-fourth ounces of guttapercha in an iron or copper kettle until it flows easily, then add ten ounces of olive oil, and, when completely dissolved, one ounce steerine. This solution while still warm is poured into the former and well mixed. Then add five ounces gum senegal dissolved in one and one-half lbs. water, and one-half ounce of lavender or other oil to flavor it. For use it is diluted with three or four parts of water. It is said to give a fine polish, is free from acid, and the glycerine keeps the leather soft and pliable.

Fat in Milk.—To determine the proportion of fat in milk, Prof. Soxhlet shakes up the milk with ether or potassa lye, so that the fat contained in the sample is completely dissolved. When the mixture is allowed to stand a layer is formed on the surface of the liquid, and from a comparison of the supernatant dissolved fat with the other portion of the contents of the vessel the problem may be solved. The specific gravity of the ethertal liquid is increased in proportion to the fat dissolved.

Good Health.

Dr. Alcott on Fruit as Food.—The purest food is fruit, next the cereals, then the vegetables, which are properly the food of animals. If it is necessary that animal food should be eaten, or because you cannot leave off that diet at once, then take it in its milder form—in the egg or oyster. The change which would be wrought by such a regimen would be slow, as nature's changes are, but the results are not the less certain. Beautiful diet, beautiful form. All pure poets have abstained almost entirely from animal food. Especially does a minister take less meat when he has to write a sermon. The less meat the better sermon. Every animal feeder is sometimes a tyrant. If one would abate that fate, he must omit it entirely, but by a gradual process. Compare a table of the present day with that spread by the hands of Eve, in Paradise, to feed her ethereal guests. Then was gathered together a feast of the purest—a banquet of right. Scholars, if they would get their lessons, can do so in a great deal shorter time and know more by adopting a pure diet. The cause of ill-temper and want of harmony in women, and peevishness of infants, and difficulties in family and other relations might be easily intimated. We are composed of atoms, and every atom must be musical and tremulous with harmony to give the body that harmony that is musical. The consent of our atome, the absolute consent of every atom to every other atom—that is harmony. Every passion leaves its impress, we know not how long. Every atom sympathizes with every other atom.—*From one of Bronson Alcott's Conversations.*

How to Kill the Blues.—Generally speaking, if you are troubled with "the blues," and cannot tell why, you may be certain that it springs from physical weakness. Instead of lying on a sofa and courting painful ideas if you are a despondent lover, a hypochondriac or a valetudinarian, you should be up and stirring yourself. The blood of a melancholy man is thick and slow, creeping sluggishly through his veins, like muddy water in a canal; the blood of your merry, chirping philosopher is clear and quick, brisk as a newly-broached champagne. Try, therefore, to set your blood in motion. To affect this don't go to guzzling down brandy-smashes, gin-cocktails, or any of the other guzzling compounds in which alcohol is disguised, for every artificial stimulant will drag you down two degrees for every one it lifts you up. The devil always heats you at a harter. Try, rather, what a smart walk will do for you; set your legs in motion on rough, rocky ground, or hurry them up a steep, cragged hill; build stone walls, swing an ax over a pile of hickory, or spade up a square rod of your garden.

A Horse with the Small-Pox.—A horse in St. Louis is recovering from small-pox. The horse was taken sick a month ago, and in a short time large boils made their appearance all over his body, and the hair fell out, until the animal looked as bare of hirsute adornment as Barnum's famous hairless horse. The formation of the scars and their development were identical with the development of small-pox cases. The animal suffered a great deal, and is now only convalescent, the postules passing out of the flesh and the hair beginning to sprout.

What to Eat.

Some Useful Hints from an Experienced Physician.

Two good hearty meals in the day are sufficient for health—one before going to work and the other after work is over; that is, breakfast and supper, or what is the same, late dinner. Some lunch is needed between these meals, but this should be light. A heavy meal in the middle of the day may suit children, but if hard work has to be resumed, it interferes with the work, and the work with digestion. Hot, heavy suppers taken shortly before going to bed prevent refreshing sleep, and are among the most frequent causes of attacks of indigestion; at the same time an empty stomach is to be avoided; a few biscuits, or something equally light, is all that is required.

Variety of diet is of importance to health; the stomach gets weary of a repetition of the same every day. Hurry at meals is to be avoided—eat slowly and chew well. Bodily toil and manual labor can be best supported by a vegetable diet, as bread, porridge, etc., with the addition of milk, eggs, butter and cheese; meat is much inferior to these as a supplier of strength. But it is very different with mental labor; here mixed diet, with animal food in moderation, is best. Fermenting drinks will always have a place among articles of diet, though health can be maintained best without them. The most wholesome are those which contain the least amount of alcohol, such as good, sound beer or claret. These, when taken moderately with meals, aid a weak digestion.

The practice of drinking stimulants as aids to work is a serious mistake; it checks the desire for wholesome food, leads to excess, and, sooner or later, injures the health. Tobacco should not be smoked just immediately before or after meals, as it weakens digestion. Too much smoking is a harmful habit, causing nervousness, shaky hands, palpitation of the heart, want of appetite and sleeplessness; when any of these occur, tobacco should be left off, or used very seldom. The practice of boys learning to smoke cannot be too strongly condemned. They think it manly, while they are really injuring their health and growth, so preventing themselves from becoming manly. Excessive tea-drinking is an evil not unusual among working women, producing ill-nourished mothers and weakly babes. Tea should not be taken more than once or twice a day, and should never take the place of a substantial meal. Health depends greatly on good cooking; the object of cooking is to render food digestible and attractive, and to give, at the same time, the greatest amount of nourishment with the least amount of waste. Every opportunity of learning and improving in this art should be eagerly seized.

Diet for Night Workers.—For night workers the best dietic plan includes a hearty breakfast when they rise, which is generally from 12 to 3 o'clock; some out-door exercise and relaxation should precede a good dinner, partaken between 6 and 9 o'clock at night, before beginning work. If the work is to continue until 4 or 5 o'clock in the morning, a light but nutritious repast should be eaten shortly after midnight, in order to fortify the system for labor during the hours immediately following, when the vital powers are most enfeebled. When the work is done, and before retiring, a very simple lunch should be taken in the form of good hot broth or beef tea, or a glass of light wine and a couple of crackers. This will generally insure sleep by withdrawing the blood from the brain, where it has been concentrated by mental effort. In ordinary cases of sleeplessness, not confirmed by long-continued habit, a light meal of this kind will generally prove a remedy. The substitution of phosphatic or so-called brain and nerve foods for a well-chosen regular diet is much to be reprobated; however excellent these preparations may be as adjuncts, a man might as well expect to work indefinitely upon the stimulation of alcohol as to live upon them without the necessary supplement of ordinary nutritious diet. By attention to these details, and by securing sufficient sleep, night workers can preserve their health under ordinary circumstances.—*Juliet Corson, in New York Times.*

A Preventive of Neuralgia.—A new invention as a preventive of neuralgia or rheumatism is a pine-wool vest which fits the body closely. In addition to their being made of this fabric, whose healing properties are well known, they are lined with chamois leather, which is perforated, so as not to check or retard the natural action of the skin.

London Railroads.—London contains 14 strictly terminal railway stations, from which no fewer than 2,202 trains depart daily, and nearly 1,600 of these leave between the hours of 10 A. M. and 10 P. M. The largest number of departures from a single terminus is 320, after which come two stations with 312 and 295 respectively. These figures are exclusive of the immense system supplying the city with local transit.

Stains of Oil Paint may be removed with bi-sulphide of carbon; many by means of spirits of turpentine; if dry and old, with chloroform. For these last, as well as for tar spots, the best way is to cover them with olive oil or butter. When the paint is softened the whole may be removed by treatment, first, with spirits of turpentine and then with benzine.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:

Saturday Morning, Feb. 18, 1882.

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Business Announcements.

Coal and Iron, J. Macdonough, San Francisco.

Dividend Notice—Northern Belle Mill and Mining Co.

Passing Events.

The vigorous rain storms of the past week give indications of a prosperous year, a subject on which there were beginning to be some doubts. An abundant snow-fall in the mountains insures a good season's run in the spring, and the reservoirs and ditches will be full.

The cold weather, with its attendant snow and ice, has of late retarded mining operations in the mountainous districts. This is, however, only temporary.

It is worthy of note that already prospectors from Colorado are beginning to make their appearance in the Wood River region. This is the advance guard of a great army of prospectors which is expected to overrun that part of the country in the spring. This is very early for men to begin going to such a place, but it shows how eagerly new and favorable prospecting grounds are sought for.

The launch of the largest steamer ever built on this coast is an event to be noted, and the Dickie Brothers and the Risdon Iron Works are to be congratulated on the success of their work.

This number of the PRESS contains a great deal of interesting matter for the miner and metallurgist.

People who do not take the PRESS cannot keep abreast of the times with regard to mining machinery.

THE Modoc *Independent* mentions the fact of the existence of good stone coal in that county. Specimens taken from the surface burn readily in a blacksmith forge and can be used in all ordinary blacksmith work.

Magnetism of Minerals.

This physical property is not much used in determining unknown minerals, but it is of great importance in practical mineralogy and geology, since the instruments used in surveying are often affected by magnetic substances. The mineral which has most magnetic power is that called magnetite, or native loadstone. It sometimes occurs in large masses and very frequently in minute grains, disseminated through rocks so as to render them magnetic throughout. In this country and in Sweden a magnetic needle mounted so as to move in a vertical plane and called a "dipping needle," has been used in the discovery and mapping of masses of magnetic iron ore which are covered with other rocks.

This is the only important or widely-distributed mineral which will attract unmagnetized metallic iron, but many minerals are attracted more or less by a magnet, or will attract a magnetized needle such as is used for surveying instruments. The ores of manganese, nickel and cobalt often have this property in a small degree, as well as many ores of iron. Some mineral substances not naturally magnetic, become so after being heated, especially the carbonate of iron, which may thus be distinguished from several minerals which it much resembles with great ease and certainty.

A convenient instrument for a mineralogist is a pocket knife, one blade of which is magnetized. Such a knife may be used in testing fine particles of powdered minerals for magnetism.

Ordinary magnetic substances, as iron, nickel, cobalt, manganese and their ores, are generally attracted by either pole of a magnet; but magnetite has sometimes distinct magnetic polarity—that is, a particular point will *attract* one end of a freely-suspended needle while it *repels* the other end; native bismuth and some few other substances repel both ends of such a needle. These are said to be diamagnetic.

Production of Quicksilver in California.

We append a table, furnished us by Mr. J. B. Randol, showing the production of the mines of California for the year. This not only gives the sources of production, but the price, total production, etc. The famous New Almaden mine, of course, leads as usual.

PRODUCTION AND PRICE OF QUICKSILVER, FOR THE YEAR 1881.

Compiled by J. B. RANDOL, Manager New Almaden mines.

Production in California during 1881, 60,851 Flasks, each of 76.50 lbs, avoirdupois.
Production in Spain during 1881, 747,571,600 Kilos—50,353 Flasks, each of 76.07 lbs, avoirdupois.

1881	New Almaden.	Sulphur Bank	Great West'n	Napa Co.	Guadalupe	New Idria.	Redding. ton.	Great Eastern.	Cloverdale.	Various	Total Production.	Price in S. F. High-est.	Price in S. F. Low-est.	Exports	Production of the Almaden, Spain.	Price in London. Highest.	Price in London. Lowest.
January.....	2253	805	461	450	1300	380	140	13	.....	43	5501	37	37	By sea and rail from San Fraocisco.	7283	49 15	49 7 0
February.....	2157	1035	300	285	600	171	32	.....	.....	4	4261	39	37		6490	7 6	7 0
March.....	2157	1139	447	350	1000	258	254	179	.....	.....	5600	38	38		7033	6 15	6 15
April.....	2507	706	447	466	1359	138	254	179	.....	.....	6071	39	37½		7270	6 10	6 10
May.....	1346	1103	631	650	500	206	285	128	.....	23	4850	37½	37½		6578	6 10	6 5
June.....	1750	1403	621	310	201	94	106	94	15	25	5618	37½	37½			6 10	6 2 6
July.....	2298	1057	714	481	255	130	100	47	48	105	5158	37½	37½			6 5	6 5
August.....	2220	635	467	502	2 1	212	187	113	32	38	5350	38	37½			6 5	6 5
September.....	2090	1139	490	490	200	140	105	100	32	5	4005	37½	37½			6 10	6 5
October.....	2090	960	435	435	200	140	100	60	32	12	4005	37½	37½			6 10	6 5
November.....	2572	1070	467	502	2 1	212	187	113	32	30	5232	41¼	37½			7 10	6 5
December.....	2162	801	434	310	375	577	180	166	.....	15	3946	37½	30½		640	6 12 0	6 5
Total.....	20,060	11,162	6,341	5,552	6 228	2 776	2,194	1,035	208	370	60,851	41¼	30½	45,790	60,553	49 15	49 7 0
				250	250	201	83	70	.....	15		37½	30½		6505	6 5	6 5

THE mineral belt north of Lake Superior, Michigan, produced last year a value of $10,000,000 in copper and $18,000,000 in iron, and since the opening of these deposits they have yielded a value of over $300,000,000 in ingot copper, pig iron, and iron ores. The Calumet and Hecla mining company has disbursed in dividends since its organization $22,000,000.

Quartz Mining in the Vicinity of Auburn.

During the year 1881 the quartz mining interest around Auburn and Ophir in Placer county has been about stationary. Some mines which, during the preceding year, produced considerable gold, were not worked, and in several others but little milling rock was taken out. In place of these a number of old and abandoned mines were prospected and reopened. The bullion yield from the best sources of information was about $75,000, rather less than the yield of 1880.

The causes of the stationary condition referred to are two-fold: First, lack of outside assistance in the shape of capital. Second, lack of enterprise, capital or knowledge of the best means of development on the part of the present owners. Capital for several years past has been shy of investing in the Auburn quartz ledges. It is quite generally asserted and believed among mining men and investors that these ledges are very pockety in the distribution of the metal they carry, and lack permanence with depth. Of many of the mines the first statement is undoubtedly true, but the second yet remains to be proven with regard to many of them.

The quartz veins of this district differ materially among themselves, within certain class limits, in nearly all important characteristics. Their general course is approximately east and west, the greater number trending north of, rather than south of east. Cross veins occur at all angles and are not uncommon in certain parts of the district. The general dip is to the south and southeast. In thickness they vary between extremes of 8 and 10 ft. on one side down to one and two inches on the other, the average being about 2½ ft. Two country rocks occur, metamorphic slate in the northern half of the district, and granite in the southern, the line of junction of the two formations running nearly east and west.

Three general classes may be made of the quartz veins, two of which are found in the slate formations and the other in the granite.

Of the two classes in walls of slate, the lesser in importance, but the most peculiar in characteristics, are what are known among miners as reef-iron ledges. They have no general direction or course, but run irregularly, crossing each other at all angles. As a rule, they are quite narrow, ranging from a few inches to two ft. Running at right angles to the strike of the country rock (slate), are belts or bands of slate highly impregnated with iron pyrites, which, wherever reached by the atmospheric water, is oxidized, and presents all the appearance of an iron ore. From these iron deposits the quartz ledges which are crossed by them are known as *reef-iron* ledges. The pay chimneys or chutes of ore, though perhaps better termed a series of pockets, are found in the ledge pitching to the west, either adjacent to or in that part where intersected by the iron reef, the rest of the ledge being worthless. Those ledges which have paid the best are found to have very irregular walls, the vein pinching and splitting into stringers wherever the iron is encountered. The yield of gold from some of these pockets is very large—they run in value from a few hundred to several thousand dollars. The valuable rock is hand-sorted, the richest crushed in mortars, and the rest worked in some custom mill. This kind of quartz mining is of necessity very uncertain in its returns, and as the amount of pay ore is comparatively small, and the ledges liable to pinch out and disappear as depth is attained, but little fixed capital is employed. It is, however, followed by small companies of working miners, to whom it recommends itself by possibilities of large returns on a comparatively small outlay, with a fair measure of success. In the aggregate a large amount of this kind of mining has been done, and has yielded a large amount of gold. The Friday, Eckley, Almatah and Iron Point are at present the most important of the mines. Very little work has been done on any of them during the past year.

The other and more important quartz ledges found in the slate have been mined much more systematically, and in some instances have proven very rich. The greater number are of the eastern end of the district, the distinctively *reef-iron* ledges being west of and between them and the granite formation. These ledges all have about the same general direction—a little north of east. On Duncan hill and in its vicinity, they are best developed, seven distinct parallel ledges averaging 30 inches in thickness being traced by croppings from 500 or 600 to several thousand ft. The presence of iron pyrite or iron oxide in the ledge walls seems to have much the same effect as in the *reef-iron* ledges, as regards the position of the ore chimneys, the difference most marked being that those ore chutes pitch to the east instead of the west. Also, instead of the quartz being barren and worthless, with the exception of a few extremely rich specimen pockets, comparatively large chutes of milling rock occur, and in these chutes, occasional rich pockets yielding from a few hundred to several thousand dollars. The ore is free milling and the gold usually quite coarse, many of the pockets being quartz rich enough for jewelers' use.

Among the most important of the mines located on these ledges are the Shurtleff, Conrad, Thorp, Hunter, Booth, Crandall and Mina Rika. Of these, the Booth and Crandall had only a little prospecting and assessment work done for several years. The Shurtleff and Conrad mines have had tunnels run to reach greater depths, and other improvements made; but little ore being taken out and milled during the year. The Hunter and Thorp mines have yielded some ore, but the main producing mine has been the Mina Rika. This latter, when the others during 1880 were yielding large amounts of ore milling from $30 to $200 per ton, was an abandoned mine. Relocated and prospected anew, a considerable body of high-grade ore was discovered. The mine, then sold to an Eastern company, has been yielding excellently for several months past, having, it is claimed, nearly paid for itself in that time.

Bellevue mine, on the west end of the mines in the slate belt, and about one-half mile north of Crater hill, is close on the line of junction between the two country rock formations. Several years since, it ranked as one of the best mines in the district. The vein was not very wide, but the ore was of high grade, free-milling $50 and upward per ton. Considerable of this rock was taken out and milled, but at a depth of about 200 ft. the ledge was lost. The mine was finally sold under execution, and after lying idle for some years, a portion was purchased by a couple of Cornish miners who had worked in the mine. They recovered the ledge at a depth of 80 or 90 ft., where it had worked off into the wall as a small stringer, and have since been taking out from a ledge 4 to 10 inches wide, rock milling $90 and $100 per ton. The sulphurets of which the rock contains a large percentage, are also extremely rich.

The quartz ledges that are found in the granite formation, are more numerous, larger, richer, more permanent, and have been worked more extensively than the ledges just described. Though some of the quartz deposits occurring in the slate are undoubtedly true fissure veins, the evidences that they are such are not near as conclusive as in the case of many of the ledges in the granite. The walls of many of the latter are smooth and striated; a gouge is usually present, and the ledges much stronger and better developed at the greater depths to which exploration has been carried. Their general course is east and west, or northeast and southwest. The greater number are concentrated around and on what is known as Crater hill. The entire surface ground in this vicinity has been washed and rewashed, yielding large amounts of placer gold, all of which, beyond doubt, came from these ledges.

(TO BE CONTINUED.)

A New Steamship.

The launch of the steamship *Mexico* from the Dickie Brothers' ship yard, this week, is a very noteworthy event, as she is the largest vessel ever built in this city. She is 285 ft. long, 36 ft. beam, 29 ft. 6 in. deep in the hold, and being 1800 tonnage. She is constructed throughout of Oregon pine, with ceilings edge-bolted with 1¼ inch square iron bolts. She is supplied with berths for 75 cabin passengers, and accommodations for 60 passengers in the steerage, all the arrangements being designed specially to afford ventilation and convenience. The cabins and saloons are yet to be furnished.

The vessel is supplied with compound engines, specially designed and built in this city, at the Risdon Iron Works. The cylinders are respectively 30 and 60 inches in diameter, and stroke 54 inches. The propeller shaft is 12 inches in diameter, bedded in heavy plates, on which the whole engine stands, coupling with connecting rods. With 80 lbs. of steam the engine will make from 60 to 65 revolutions per minute, and drive the vessel at the rate of 12 knots an hour. The shafting is 100 ft, long. The propeller is made of composite metal, is 13 ft. in diameter, and weighs six tons.

The engines are supplied with steam from two double-ended boilers, provided with two furnaces at each end. These boilers are 11 ft. in diameter and 17 ft long. There are also two super-heaters 6 ft. 8 inches in diameter and 6 ft. in length. A casing of iron has been built around the boiler room 36 ft. in length, 12 ft. across, and 18 inches above the awning deck, which gives perfect security against fire. The weight of the machinery is 250 tons. There is also a donkey engine for running anchor windlass and hoist, which is supplied with steam from main or donkey boilers. There are also four donkey pumps on board for fire and water purposes, and a centrifugal pump for the condenser. The entire machinery is fitted with the latest and newest improvements.

The *Mexico* will have cost the company, when ready for sea, something over a quarter of a million dollars.

GATHERING COURAGE.—The Wood River *News* says it is pleasing to see how prospectors and miners in the ore belt from Bellevue to Bullion are striking with tunnels and shafts to attain depth. It was not so until late last fall. They were afraid to dig deep, but Col. Wall, H. E. Miller and a few others have struck deep and won, and the spirit to be brave is now evinced in hundreds of instances. They are right. Depth attained brings up richer ores and there is no diminution in width of vein to our knowledge.

MECHANICS' INSTITUTE ELECTION.—At the annual election of Trustees of the Mechanics' Institute this week, the following were chosen: P. B. Cornwall, J. A. Bauer, D. A. Macdonald, David Kerr, J. R. Wilcox, G. H. Hoppa and Edwin Tretwell.

Notes on Mica.

[Written for the PRESS by HENRY G. HANKS, State Mineralogist.]

Inquiries have been so frequently made at the State Mining Bureau concerning the uses and value of mica, and so many worthless samples sent for examination, that it has been thought best to publish such facts as will afford the information so often asked.

The uses of mica are few; but as there is nothing to supply its place, and as it is seldom found in large sheets or in large quantities, it will always command a good price, which will depend upon the supply; and as the demand is steadily increasing, there is no likelihood of the market being overstocked. The chances for discovering good merchantable mica in California are better than in most countries, for the reason that the field is new, and that multitudes of educated prospectors are looking for any mineral that can be turned to account. It is to give them all information on the subject that this paper is written, in the hope that a valuable deposit may be found in the State, and to prevent them from wasting their time and incurring unnecessary expense in attempting to develop worthless material.

The writer of the following letter applied to the Mining Bureau for information as to any workable deposits of mica in the State, and gave in return information as to its value in Europe, which he was asked to put in writing for the benefit of those interested.

Copy.

H. G. Hanks, Esq., State Mineralogist—DEAR SIR: During a recent journey through Germany I called on Mr. Max Raphael at Breslau (Prussia), a manufacturer of mica articles, who commissioned me to obtain for him good merchantable mica, of which he is willing to purchase any quantity, and which, he thought, may be found in California and other States of the Pacific coast.

To enable me to judge of the quality needed by him, he gave me some types of such mica as he is using in his factory. It comes mostly from East India, shipped via. Calcutta to England. When finally split, the red-brownish tint is scarcely visible. Mica from the Pacific coast has a greenish tint, and is inferior to the East India, yet Mr. R. says it is suitable for his purposes. Herewith I beg leave to hand you some of these types, viz.: Nos. 1, 2, 3 and 4. These are considered to represent merchantable mica. No. 3 is of extra fair quality, though it would scarcely yield plates larger than 3x5 inches, the balance being streaked and worthless. Nos. 5, 6, 7, 8, 9 and 9a are samples of worthless mica.

Nos. 11, 12 and 13 are plates such as are obtained from good mica, as shown by Nos. 1 to 4.

The value depends entirely upon the square or oblong size which it will yield when split. Sizes less than 2½x5 inches are valueless, for these are abundantly obtained in working up large pieces.

A fair quality of mica, yielding 3x5 inches, is worth about 50 cents per pound; 3½x5, 50 cents; 3x6, 62 cents; 4x6, $1; 5x9, $1.25; 7x7, $1 62; 8x8, $1.75; 9x9, $2.25; 10x10, $2.50; 12x12, $3.

These prices demonstrate that the mining of mica can be made very remunerative. Surface mica is always of inferior quality; in going downward the strata become well-defined, less disturbed, denser and purer. Good mica must be free from flaws and foreign substances, must split readily and be clear and transparent.

Were such mica obtainable in California or the Pacific States, it would be to the interest of the parties mining it to send fair samples to your Bureau. Such samples should not consist of a thin layer split off, or insignificant pieces of the mineral, but be fair specimens of the mine or ledge, taken some 5 or 10 ft. below the surface or croppings. These specimens, from one-quarter to one and one-quarter inches in thickness, need not be trimmed square, but may be pieces in their irregular shape, though freed from adhering rock or ledge matter.

Only when large quantities are to be shipped it is best to trim the pieces oblong in order to save expense.

The party previously named authorized me to contract for the permanent delivery of large quantities. For the convenience of mine owners the mica might be delivered at the mine, or the nearest railway station.

Very respectfully and truly yours,
(Signed) HENRY JACOBY,
439 California Street.
San Francisco, Jan. 30, 1882.

The word mica is used at the present time to designate a group of minerals of different chemical composition rather than a single species. They were all included under the designation until 1792, when lepidolite was found to be a separate species, and given a specific name, which it still bears. The minerals of the mica group, however, have certain physical properties in common, among which is the characteristic one of cleavage parallel to the basal plane of the crystal. What is generally known as mica, and seen only in very thin laminæ, is in reality only a small portion of the crystal. A perfect crystal of mica is seldom found in nature. This fact results from the facility with which the thin laminæ separate in the plane of natural cleavage. To realize what a mica crystal is like, imagine a multitude of thin cards cut into hexagonal or rhombic forms and piled upon each other, commencing at the base with the smallest, increasing gradually to the center, and diminishing again to the top of the mimic crystal.

Large sheets of mica have been found in Norway and Sweden. In the United States, mica in sheets sufficiently large to have a commercial value has been found at Alstead, Grafton and Acksworth, New Hampshire, at Mt. Mica, Maine, and in Canada. In 1867, mica mines that had been anciently worked, were rediscovered in Mitchell county, North Carolina.

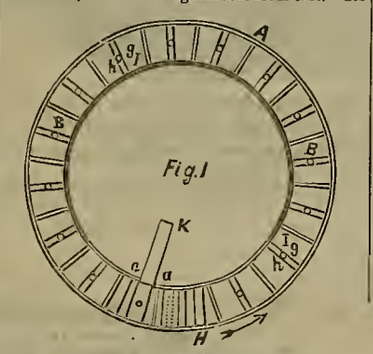
The large sheets of mica brought to the European market are principally from Siberia. The mineral is known in commerce as isinglass—*glaces mariæ*—and sometimes Muscovy glass, because it was first found in quantities in that part of Russia formerly called Muscovy.

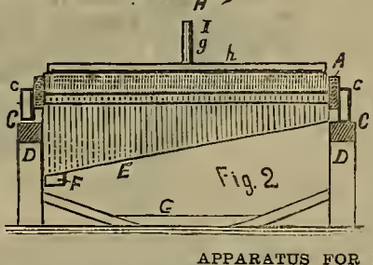
Pliny confuses several minerals under the name of "speculer stone." Probably mica and selenite are alluded to, in writing of the *lapis specularis*; and it is doubtful which was used "in shavings or scales to sprinkle in the Circus Maximus at the celebration of the games, for the purpose of producing an agreeable whiteness;" but Dana thinks it may have been a silvery mica schist.

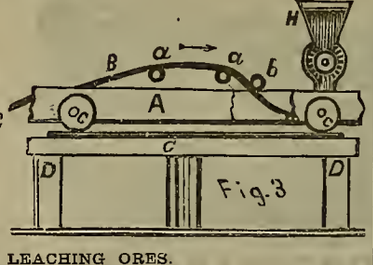
Silvery and golden-colored mica were called "cat silver" and "cat gold" in the middle ages.

Richard Kirwan, in his Elements of Mineralogy, published in 1774, thus describes "pure mica:"

"This stone in its purest state is colorless, but, either from a less intimate combination, or from a mixture of some superfluous ingredient, principally iron, it is found of different colors, white, red, yellow, green, brown, or black. The white and yellow sort have a splendid metallic appearance—smooth but not greasy to the touch, which distinguishes it from talc. Its







APPARATUS FOR LEACHING ORES.

texture is always lamellar or scaly, and the lamellæ or scales are slightly flexible and often elastic. These scales are sometimes parallel to each other, sometimes interwoven, sometimes wavy or undulated, and sometimes they represent filaments. Its specific gravity is from 2.535 to 3.000 when loaded with iron. It does not effervesce with acids and is insoluble in them, without particular management, but, after it has been calcined with four times its weight of fixed alkali, it effervesces strongly, and is in a great measure soluble. The pure, colorless mica is infusible *per se*, and scarcely melts even with mineral alkali, but yields more readily to borax or microcosmic salt, with scarce any effervescence, but the colored sorts were found by Mr. Saussure to be soluble *per se*, though with difficulty, for they require a stronger heat than ehoerl does.

One hundred parts of the colorless kind contain 38 of silex, 28 of argill, 20 of magnesia and 14 of the most dephlogisticated calx of iron. Martial mica contains besides 10% or 12% of a more phlogisticated calx of iron, from which its various colors are derived, and a proportionately smaller quantity of the other ingredients."

Mica can be distinguished from other minerals by the following tests: It must have the property of splitting into thin laminæ which, by careful manipulation, may be again and again divided into thinner sheets. The scales, no matter how thin they may be, must be tough and elastic, in the which they differ from selenite and jeffersite, which are often mistaken for mica. The thin films must be transparent even if the larger masses were dark-colored and apparently opaque. The surface of the films must be smooth and highly polished, and must remain unchanged when heated to redness in the flame of a spirit lamp or similar source of heat. Mica is easily scratched by a knife, and sometimes with the finger-nail. According to Hauy, laminæ of mica may be obtained by division so thin that it would require 250,000 to make an inch in thickness. Mica is never found in very large masses, nor in beds or deposits, yet it is one of the most abundant of all the minerals which form the earth's crust. Slabs of mica have been found in Russia two and a half yards square. In Siberia large masses occur in granite and are specially mined. Mica is one of the constituents of many of the rocks, as granite, gneiss mica, schist mica, slate, etc. The largest plates occur in veins of granite. It occurs accidentally in seyenite, euphotide, hypersthenite, diorite, trachyte and basalt.

Mica sometimes forms artificially in furnaces in which copper and other metals are melted, and the walls of such furnaces in which sandstones are used for lining sometimes become coated with a fine pearly mica, which probably derives its potash from the ashes of the wood used for fuel. An analysis of such a formation gave to Mitscherlich the following result:

Silica	47.31
Alumina	5.74
Peroxide of Iron	28.91
Peroxide of Manganese	10.48
Magnesia	10.17
Potash	1.05
Lime	6 23
	99.89

In crossing certain streams or rivers flowing in shallow sandy beds, quartz sand may be seen to roll forward beneath the water, remaining near the bottom, but particles of mica, frequently of a golden color, rise with the force of the stream to the surface and glitter and gleam in the sunlight like particles of gold, for which they have often been mistaken. This peculiarity of mica was frequently noticed in the Platt river by the early emigrants to California, and by those who had discovered the mistake it was called "*Fools' Gold.*"

There is a specimen of yellow mica schist (No. 1626) in the museum of the State Mining Bureau from a large deposit, which caused the Gold Lake excitement, and it is so like the precious metal in appearance that it is not surprising the mistake should have been made. With the advancement of invention there has been created an increased demand for mica, which has raised the price to that extent that a deposit of the best quality would be very valuable to the finder.

(TO BE CONTINUED.)

Chloro-Bromide of Lead.

In the treatment of Leadville carbonate ores by the blast furnace, Mr. Malvern W. Iles noticed a number of very curious and interesting compounds. A compound having the formula Pb (Br Cl) was discovered, occurring as a furnace product, in small (2½ inch) circular openings in the cast-iron supporting plate, 11½ inches above the water-jacket. The iron ring rests upon four cast-iron columns, and supports the sheet-iron fire-brick lined structure above. This ring plate is perforated by holes, which serve to prevent a total rupture of the plate by the expension caused by the internal heat. The course of fire-brick at the bosh es close these holes from below, while the interior fire-brick lining covers these circular openings, thus forming a small condensation chamber, in which the chloro-bromide of lead was found. In order to see whether this compound was contaminated with any silver salt, it was assayed, one-tenth assay ton yielding by cupellation only a most minute trace. Hence it is to be concluded that this was simply an accidental occurrence of a small amount of ore, or a trace of a volatile silver salt. It was noticed that the white fumes which condensed upon surrounding cool objects yielded 3½ ounces of silver per ton; hence it is not improbable that there is some volatile compound of silver not clearly identified, and which mingles slightly with the chloro-bromide of lead. The furnace crystals occurred in several forms—as, for example, in pure white, delicate plates, not unlike crystals of lead chloride; in long needles; in semi-fused, distorted needles, having a slightly yellowish tint; and also in entirely fused masses. The crystals dissolve in warm water, forming a milky-white turbidity, which readily clears up on the addition of a few drops of nitric acid. The aqueous solution deposits plate-like crystals, and from the moderately dilute solution, by slow crystallization, one may obtain doubly terminated acicular needles, considerably thickened in the central portion. The body sublimes on charcoal, giving a white coating. In a closed tube it melts readily to a bright red color; upon cooling it lightens up, changing from a lemon yellow to a pure white; on increasing the heat it sublimes in heavy oily drops. Density, 5.741. This product is found to be very stable, and is decomposed by boiling concentrated sulphuric acid only by repeated applications, and the complete transformation into a sulphate is difficult.

Ore Leacher.

Messrs. Shalder & Russel, of West Jordan, Utah, have invented an apparatus for leaching ores on a large scale. The invention consists of a circular frame supporting the filter and moving on a circular track above an inclined circular table. There are three stationary rollers, designed to elevate and depress the filter at certain points as it revolves. There is also a device for feeding the substance to be leached upon the filter; one for applying the leaching solvent, and a precipitating tank to contain the solution passing through the filter.

Fig. 1 of the engravings is a plan of the circular revolving frame or filter. Fig. 2 is a transverse sectional elevation of the revolving frame, filter, circular table, and device for applying the leaching solvent. Fig. 3 is an elevation, partly in section, showing the revolving frame, circular track and table, filter, adjusting rollers and feed apparatus.

In the drawings *A* represents the circular frame, carrying between its sides a filter, *B*, of canvas, matting or other suitable material. Extending transversely under the filter, *B*, from the point at which the ore or other substance is discharged, are the two stationary rollers, *a a*, which serve to raise the filter at that point. Just beyond these rollers, *a a*, as the frame, *A*, and filter, *B*, move in the direction of the arrow is a third stationary roller, *b*, set lower than the rollers, *a a*, so that the filter, *B*, shall pass under it. This frame, *A*, is set in wheels or rollers, *c*, that rest on a track, *C*, which track is supported on a framework, *D*, of the device. Beneath the filter is a circular inclined table, *E*, around the inner and lower edge of which is a trough, *F*, below which is the precipitating tank, *G*.

H is the feeding device to feed the ore. *I* is the device for supplying the leaching solvent, which device consists of a rubber tube, *g*, connected at right angles with a tube, *h*, that is filled with perforations on its under side, so that the leaching solvent, in passing through said tubes, shall be sprinkled, in a finely comminuted condition, upon the ore or other substance on the filter, *B*.

K represents a conductor for directing water upon the filter at a point immediately over the rollers, *a a*, in order to wash off leached ore or other substance.

In operating this device the comminuted ore or other substance is delivered by the feed apparatus, *H*, upon the filter, *B*, directly in front of the roller, *b*, so that as the filter, *B*, revolves, the said ore or other substance shall, from this point until it reaches the rollers, *a a*, be exposed to the action of the leaching solvent, which is discharged upon it from the pipes or tubes, *g h*, the leaching solvent at the same time dissolving the precious metal or other substance contained in the ore, and, filtering through the filter, *B*, falls upon the inclined table, *E*, thence, into the trough, *F*, which conducts it to the precipitating tank, *G*, for treatment.

As the said frame, *A*, and filter, *B*, continue to revolve, the filter, *B*, passes over the rollers, *a a*, at which point the ore or other substance upon the filter is found to be deprived of its soluble metal or other substance, and at this point, above the rollers, *a a*, water is discharged through the pipe, *K*, upon the filter, *B*, to wash off the exhausted ore or other substance. The filter, *B*, then passes down beneath the roller, *B*, and receives a fresh supply of material from the feed apparatus, *H*, to be operated on.

The inventors say it has been found in practice that a filter four feet wide, the circle of which has a diameter of 40 ft., will leech 50 tons of ore in 24 hours, and that the apparatus can be applied wherever leaching tanks are now used.

Coal on the Pacific Coast.

The following table copied from the census gives the production of bituminous coal, etc., west of the 100th meridian:

NAME OF STATE.	No. of mines.	Horse-power of engines.	Value of all machinery.	Total capital employed & invested.	Acres of coal land.
California	478	295	377 500	$1,239 431	2 900
Colorado	1,133	749	100,650	5,939 250	23,529
Montana Ter.	3	.....	.....	12 550	.....
Oregon	52	60	13,000	226.523	2 640
Washington Ter.	103	115	15,500	345.421	2,600
Wyoming Ter.	830	2 8	59,000	726.398	1,200
Total	2,599	1,447	$265,650	$8,479,573	32,938

THE LICK TELESCOPE.—The work of Messrs. Alvan Clark & Son on the lenses for the Lick telescope has not yet commenced. The glasses have not yet even been cast. That work is to be done by a famous firm of Paris. The Messrs. Clark are just now busily engaged, night and day, upon the lenses for a great Russian telescope. They have just finished a superior telescope for the New Bedford high school. It required six months of various castings to obtain proper glasses for the Russian telescope. One of the glasses had an imperfection in it, and in order to utilize it, the glass will be a trifle thinner than originally contemplated, thus requiring a larger focus. The rough glasses for the Lick instrument are expected six months hence.

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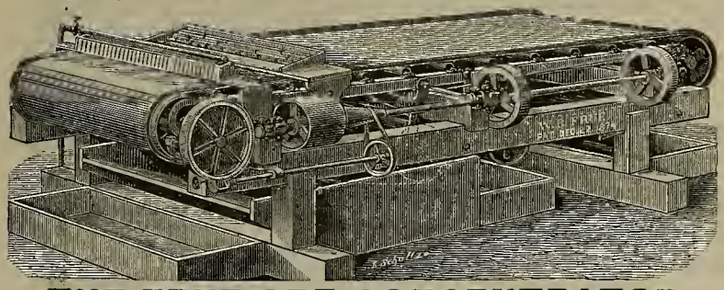

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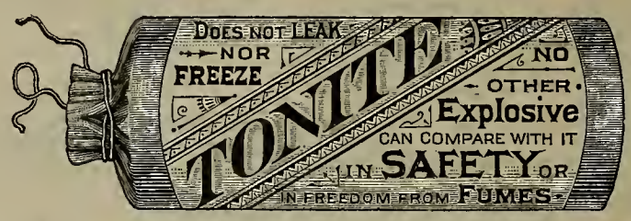

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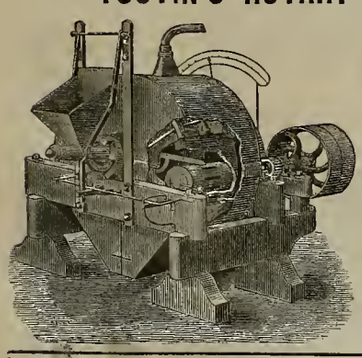

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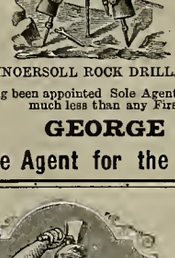

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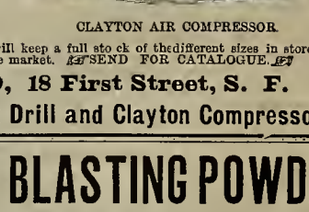

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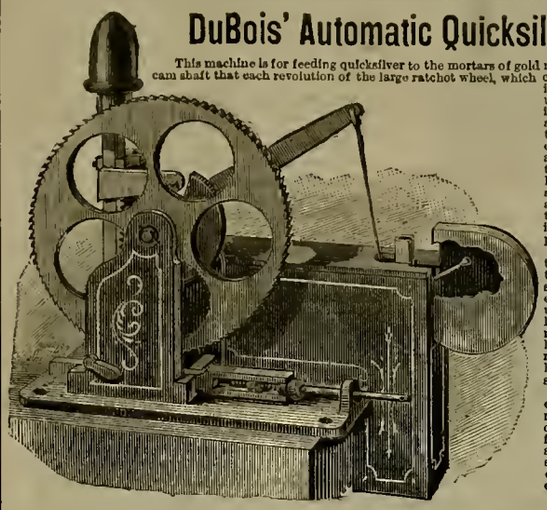

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.
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PARKE & LACY, Sole Agents, 21 and 23 Fremont St., S. F.

STEEL CASTINGS
FROM 1-4 TO 10,000 lbs. WEIGHT.
True to pattern, sound and solid, of unequaled strength, toughness and durability.
An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over other Steel Castings.
CRANK SHAFTS, SHOES, DIES and GEARING specialties.
Circulars and Price Lists free. Address
CHESTER STEEL CASTING CO.,
Works, CHESTER, Pa. 407 Library St., PHILADELPHIA

SELBY SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.

Gold and Silver Refinery And Assay Office.

HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.

Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.

This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

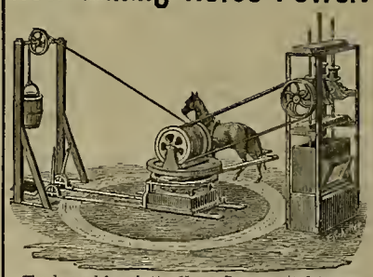
Business Directory.

WM. BARTLING. HENRY KIMBALL
BARTLING & KIMBALL,
BOOKBINDERS,
Paper Rulers & Blank Book Manufacturers
505 Clay Street, (southwest corner Sansome),
SAN FRANCISCO

JOHN A. CHURCH, E. M. PH. D.
MINING ENGINEER,
Room 75, 115 Broadway, New York.
☞Agent for PADDOCK'S Ore Dressing Machinery. Mining Machinery supplied.

San Francisco Cordage Factory.
Established 1856.
Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
Extra sizes and lengths made to order on short notice.
TUBBS & CO.,
611 and 613 Front Street, San Francisco

New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
C. H. BAKER,
Agent and Manufacturer of Mining Machinery
38 and 40 Main St., S. F.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

Palmer's Safety Clutch
FOR
ELEVATORS
Will be Applied to Elevators on Short Notice.

☞It is now used in the U. S. Army Building and Grand Hotel, New Montgomery Street.
Agency, 303 Montgomery St., S. F.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

BODY BRACES.—Jas. W. Anderson, Bodie. No. 253,251. Dated Feb. 7, 1882. This invention relates to a brace for the body and shoulders, the principle of which is in providing a suitable means for pressing forward the small of the back, whereby the body is kept straight and the shoulders prevented from being thrown forward. The invention consists of supports properly connected and shaped to fit the abdomen, and a band or strap which passes from the front support around the waist, said strap having upon it a pad which fits the small of the back. The object of the invention is to straighten and support the body, and by this means to cause the shoulders to be kept back, because, having the lower part straight, it is inconvenient to throw the shoulders forward. The invention is therefore a body straightener and a shoulder brace.

ORNAMENTATION OF GROUNDS.—Henry D. Cogewell, S. F. This invention relates to the ornamentation of grounds, such as cemetery lots, gardens, lawns, public parks or open spaces of any description; and it consists in the formation of gutters or ornamental spaces of artificial stone, asphalt, terra-cotta ware, metal or other suitable material in sections which have uniting flanges and particular kinds of supports, by which they are kept level and in place. These gutters and grounds may have spaces or openings formed in them in the shape of birds, animals, astronomical or geometrical, or other ornamental figures, proportional to the space, through which grass or other vegetation is allowed to grow so as to form the device which is cut off.

SEEDERS AND CULTIVATORS.—John E. Henris, Dixon, Solano Co., Cal., No. 253,285. Dated Feb. 7, 1882. This invention relates to that class of agricultural implements known as seeders and cultivators, the object of which is to sow the seed and cover it up. It consists in an appropriate wagon carrying a hopper containing regulating and feeding plates, and opening out into spouts leading to receivers surmounting a rotary distributing disk. Upon the rear of the frame are independent arms carrying adjustable cultivators. Appropriate mechanism, receiving motion from the wheel, operates the various parts.

WATER-WHEEL.—Royal N. Davidson, Weaverville, Cal. Dated Feb. 7, 1882. No. 253,267. This invention relates to that class of water-wheels which are operated by the forcible discharge of a stream of water upon the buckets or flanges on the rim of the wheel, and are commonly known as turbines. The improvements consist in certain details of construction. This is a central discharge wheel. The force of the stream is directed against the buckets and against the conical side of the wheel. After expending its force it is conducted toward the center, and because of a peculiar conical side, is discharged out of line of the power stream, and thus does not interfere with it, nor do the contents of one bucket interfere with another.

LATHE ATTACHMENT.—Henry Richmann, S. F. Dated Feb. 7, 1882. No. 253,314. This invention relates to a novel attachment for lathes, which is adapted to cut the teeth of gear wheels, ratchet teeth, spiral grooves for twist drills, key seats or ways in shafts, bolt heads, nuts, and various kinds of irregular work which ordinarily requires special and complicated apparatus. It consists of a support which has a foot that may be clamped to the tool rest of the lathe. This support is slotted to receive a bolt which holds an adjustable standard, through which the spindle passes, which drives the various cutting tools that are secured to it. This spindle is driven by gearing, or pulley, or both. The belt from the pulley passes up over two pulleys which are vertically adjustable, to allow the tool to move longitudinally upon the lathe bed and thence down to the main pulley in the head block of the lathe, a counterbalance keeping up the tension.

PALMER SAFETY CLUTCH.—We have been shown a handsome working model of this device, which we recently illustrated. The model is complete in every particular, is made of metal, and silver plated. It shows a passenger elevator with the Palmer safety clutch, safety governor, etc. Also the device for stopping the elevator at any point, so arranged that the elevator boy can operate it. It looks impossible for an elevator to come to any accident with these appliances connected with it. The elevator in the Grand Hotel, that of the army headquarters, and several others are now supplied with this safety attachment.

ALL the stamps of the Homestake mining company are again in operation. A new and rich discovery of ore is reported on the 100 level directly under Lead City, but no ore is being removed.

Recent Contributions to the California State Mining Bureau.

[Furnished by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

Arenaceous Sandstone—Found in the bed of the river, near Yreka, Siskiyou county, Cal. Dr. F. G. Hearn.

Borings from James Phelan's Well—O'Farrell St., S. F. A, 185 ft. deep; B, 192; C, 200; D, 225; E, 240; F, 245; G, 251; H, 260; I, 265 ft. J. Z. Davis.

Silver Ore—Dundee mine, Globe district, Pinal county, Arizona. C. Fraser.

Actinolite—Twelve miles east of Gilroy, Santa Clara county, Cal. Wm. Brannan.

Silicified Wood—Chalk Bluffs, Nevada county. A large quantity and great variety of specimens. John Spaulding, superintendent of South Yuba M. & M. Co.

Gold in Porphyry—Banghart mine, 10 miles north of Shasta, Shasta county, Cal. W. Banghart.

Silver Ore—Large specimen; Phil Sheridan mine, Granite Creek mining district, Grant county, eastern Oregon. C. S. Miller. This specimen contains chalcosite or tetrahedrite; rich in silver and free gold. Assay value, $160 per ton. (See No. 3431.)

One Hundred Foreign Birds—J. Z. Davis.

Silver Ore—Unknown mine, Yankee Fork mining district, Salmon River mountains, Custer county, Idaho. Wm. B. Hyde.

Silver Ore—Custer mine, Yankee Fork mining district, Idaho. Wm. B. Hyde.

Crude Soda—Big Soda lake, Churchill county, Nev. John Flemming.

Sal Soda Made from Crude Soda—Big Soda lake, Churchill county, Nev. John Flemming.

Marble—From the cave at Cave City, Calaveras county, Cal.

Copper Ore—Eagle mine, Quail hill, Calaveras county, Cal. A. S. Church.

Bedrock—Malakoff mine, North Bloomfield, Nevada county, Cal.

Bedrock—Malakoff mine, North Bloomfield, Nevada county, Cal.

Bowlder—Polar Star mine, Dutch Flat, Placer county, Cal.

Cement with Gold—Chimney Rock, Green Valley claim, near Dutch Flat, Placer county, Cal. H. Boek.

Pipe Clay—Malakoff mine, North Bloomfield, Nevada county, Cal.

Calcite with Pyrite—Malakoff mine, North Bloomfield, Nevada county, Cal.

Bedrock—Malakoff mine, North Bloomfield, Nevada county, Cal.

Rock Used in Paving the Flumes—Milton hydraulic mine, Nevada county, Cal.

Bedrock—Gold Run, Placer county, Cal.

Quartzite—Malakoff mine, North Bloomfield, Nevada county, Cal.

Bedrock—Cherokee, Nevada county, Cal.

Bedrock at Flume—Milton mine, Nevada county, Cal.

Bedrock—American mine, near North San Juan, Nevada county, Cal.

Porphyry Bedrock—Malakoff mine, North Bloomfield, Nevada county, Cal.

Hard Cement with Gold—Malakoff mine, North Bloomfield, Nevada county, Cal.

Chalcedonic Bowlder—Polar Star mine, Dutch Flat, Placer county, Cal.

Rock Specimen—Bridge at Yuba river, below Blue Tent, Nevada county, Cal.

Geode of Calcite—Sweetwater, Nevada county, Cal.

Bedrock at Flume—Milton mine, Nevada county, Cal.

Bedrock of Manzanita Mine—Nevada City, Nevada county, Cal.

Bowlder—Malakoff mine, North Bloomfield, Nevada county, Cal.

Bedrock at End of Flume (Gneiss)—Milton mine, Nevada county, Cal.

Pyrite Found in Lignite (Large Tree)—Malakoff mine, North Bloomfield, Nevada county, Cal.

Copper Shale—Sweetland Creek mine, Nevada county, Cal.

Pyrolusite Found in Copper Shale—Sweetland Creek mine, Nevada county, Cal. (See No. 3412).

Bedrock—Malakoff mine, North Bloomfield, Nevada county, Cal.

Serpentine (?)—Bald Pararie, Placer county, Cal.

Jasper—Bald Pararie, Placer county, Cal. Chas. Purdy.

Gold Quartz—Phil Sheridan mine, Cranite mining district, Grant county, Oregon. C. S. Miller.

Porphyry Bowlder—Polar Star mine, Dutch Flat, Placer county, Cal.

Bowlder—Polar Star mine, Dutch Flat, Placer county, Cal.

Calcite—Polar Star mine, Dutch Flat, Placer county, Cal.

Gold Quartz—Murchie mine, Nevada county, Cal.

Jaspery Iron Ore—Northwest corner of Sonoma county, near Point Arena. L. L. Bullock.

Silicified Wood—Omega, Nevada county, Cal. Duncan McLaughlin.

Gold Quartz—Champion mine, Yuba river, near Omega, Nevada county, Cal. D. McLaughlin.

Silver Ore (?)—Waterman mine, Grapevine district, San Bernardino county, Cal. A. M. Lawver.

Silver Ore—El Robles mine, Sinaloa, Mexico, 70 miles from Mazatlan. John Wasson.

Silver Ore—Jackson mine, Esmeralda county, Nev. Wm. H. Sears.

Lignite—Oregon. Oregon Steam Navigation Co.

Gold Quartz—Golden Hero mine, near Copperopolis, Calaveras county, Cal. J. K. Hicks.

Granite of which the Mormon Temple is Built—Salt Lake City, Utah. J. W. Wilkinson.

Silver Ore—Monumental mine, Granite mining district, Grant county, Oregon. C. S. Miller.

Wall Rocks of Monumental Mine—Crant county, Oregon. (See No. 3431.)

Foliated Talc—Altaville, Calaveras county, Cal.

Silicified Wood—Nevada county, Cal. J. Z. Davis.

Pig Iron—Oregon Iron Co., Oswego, Clackamas county, Oregon. Allen & Lewis, agents.

Iron Ore, Prosser Iron Ore—Oregon Iron Co. Allen & Lewis, agents.

Diatomaceous Earth—Cayetano ranch, Santa Clara county, Cal. J. E. Bowman.

Jeff risite—Alaska. Thos. McCully.

Psilomelane—Alaska. J. H. McMillan.

THE Shasta *Courier* says: Quite a number of practical and wide-awake quartz prospectors from other counties have lately come to Shasta to hunt for quartz, and several of them have told us that the mining interest of this county is attracting considerable attention,

News in Brief.

JOSEPH DE CAISNE, the distinguished botenist, is dead.

THE Yuma *Free Press* states that the steamer *Mohave*, on her last trip up the Colorado river, took 44,000 lbs. of grain and merchandise, and 10,000 lbs. of machinery.

CHAS. W. STEVENS died Monday in New York. He built the first locomotive run in California, and superintended the building of the first railroad in Oregon.

THERE are several prisoners in the County Jail, says the Gold Hill *News*, who are imprisoned for trifling offenses, committed in order to procure free board and lodging.

NOTHING more will be heerd about admitting M. D. Ball as delegate from Alaska till the Committee on Territories report on whether or not Alaska will be organized as a Territory.

THE San Jose *Headlight* states that in the middle of the Pajaro river a subterranean spring has appeared, discharging water, quicksand and mud, which is forced to a distance of several ft. above the river's surface.

THE House Commerce Committee have reported favorably Berry's bill to erect a light-house and fog signal at Point St. George, Cal. It is to be located northwest of Seal Rock. Fifty thousand dollars is the amount appropriated.

LEADING members of the House Banking Committee say that after consideration of the subject they are confident that the House will pass the bill making the trade dollar a legal tender, and that the interest which opposed it before will now allow it to pass.

LARGE fires were raging in several of the Sacramento river islands last week. West's island was almost entirely denuded of vegetation. The air was filled with flying cinders and smoke. Some of the fires are reported to be the work of careless hunters.

ALLISON, Chairman of the Senate Committee on Appropriations, has a letter from the President of the Pennsylvania Railroad Co., in which he says: "Our company had at no time, nor have they now, any intention to make any claim for compensation for the courtesies extended to the late President and his family or to the officers of the Government."

THE following circular has been issued by the Treasury Department: On the exportation of flour wholly manufactured from imported wheat the drawback will be allowed at the rate of 89 cents per barrel, less the legal retention of 10%. Collectors will see that proper arrangements are adopted by mills within their districts, where flour may be prepared for exportation with the benefit of the drawback to imported wheat at any stage of the process of its conversion into flour.

ANNUAL STATISTICIAN.—We have received a copy of McCarty's "Annual Statistician" for 1882. It is scarcely possible to think of any general statistical information which is not given in brief form in this little book. The chronological tables are very complete and condensed. Its geographical information is also very full. The biographical index gives the name, vocation, date and place of birth, etc., of 4,250 of the most prominent men and women of the last 3,000 years. There is a large mass of information about the United States; and about the revenue, expenditures and public debt of all the principal nations of the globe. Mathematically it is replete with tables of all weights, measures, units, and all sorts of things. Of the Pacific States, it contains the governors and rulers' from their commencement to date; population by counties; population of every city, town or locality; cereal productions; minerals produced, imported or exported. Miners' inches, and force of water illustrated; hydraulic pipe and hurdy-gurdy wheels as used on the Pacific coast; and every presidential, congressional and gubernatorial election ever held in California (by counties), from 1851 to 1880. Every presidential election ever held in San Francisco; and every earthquake felt in San Francisco, for the past 30 years. Even a summary of the contents would take a great deal of space. The book is a very handy one for reference containing, as it does, such large and varied contents and such a very wide range of subjects within one pair of covers.

THEORY OF GRAVEL CHANNELS.—In the correspondence column of the PRESS of Oct. 8, 1880, appeared an article advancing a theory of the formation of gravel channels, addressed to the editor of this journal and signed "L." This article was copied in the report of the Director of the Mint and credited to this paper. Shortly afterward an abstract of the theory was telegraphed to this coast, and published in the Associated Press as the theory advanced by the Mint Director. Knowing it had originally appeared in these columns and that the Mint Director had given proper credit in the publication under his control, one of the editors of this journal wrote an item to that effect. In that item, however, it was stated that the theory was written by "the editor of this journal," the writer supposing it to have been written by one of his associates. This was an error, however, the credit being due to Mr. A. Larson, of Dutch Flat, Placer county, who wrote the original article. As his name was not signed to it the Mint Director did not credit him with it, though the PRESS was credited. It was simply an oversight in our not connecting his name with it in the instance above mentioned.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central system in San Francisco.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. MCCREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
B. W. CROWELL.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.

ANNUAL STATISTICIAN of 1882.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 816 California st. Price, $4.

Dewey & Co.'s Patent Agency and Newspaper Offices.

Dewey & Co.'s Patent Agency and the business offices of the Mining and Scientific Press, Pacific Rural Press, Pacific States Watchman and the Fraternal Record are now avorably situated at No. 252 Market Street. Elevator entrance, *No. 12 Front St., S. F.*

Business Offices and Sunny Rooms to Let.

We have some desirable rooms to let adjoining the offices of this paper which will be rented on favorable erms. Stair entrance, No. 252 Market St. Elevator, No. 12 Front St. Parties wishing offices, etc., will do well to call and see them. DEWEY & CO.

Cylinder Printing Press for Sale.

A large cylinder Hoe printing press, for country newspaper work, can be bought cheap by addressing Press, Box 2361, S. F.

San Francisco Metal Market.

[WHOLESALE.
THURSDAY, February 16, 1881.

IRON.—	
American, Pig, soft, ton	— @35 00
Scotch, Pig, ton	25 50 @27 50
American White Pig, ton	— @— —
Oregon Pig, ton	— @33 00
Clipper Gap, No. 1	— @32 00
Clipper Gap, White	— @34 00
Clipper Gap Car Wheel	— @35 00
Rebned Bar	4 @—
Horse Shoes, Keg	— @ 5 50
Nail Rod	— @ 7¼
Norway, according to thickness	6½@ 70
STEEL.—	
English Cast, lb	13 @ 15
Black Diamond, ordinary sizes	13 @ 16
Drill	15 @ 15
Flat Bar	16 @ 18
COPPER.—	
Ingot	— @ 22
Sheet	— @ 30
Sheating, Timed 14x18	— @ 31
Nails	— @ 17
Bolts	— @ 33
Old	— @—
Bar	— @ 22
Cement, 100 fine	— @ 15¼
LEAD.—	
Pig	— @ 5
Bar	— @ 6
Pipe	— @ 8
Sheet	— @ 9
Shot, discount 10% on 500 Bags	
Drop, per bag	— @ 2 10
Buck, "	— @ 2 30
Chilled "	— @ 2 50
TIN PLATES.—	
10x14 I C Charcoal	7 00 @ 8 00
10x14 I C Coke	5 25 @ 6 50
Banca Tin	— @22 50
Australian	— @23 50
I. C. Charcoal Roofing 14x20	— @ 6 90
ZINC.—	
By the Cask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @ 10
NAILS.—	
Assorted Sizes	4 00 @ 4 15
QUICKSILVER.—	
By the flask	@36½ 36½
Flasks, new	— @ 1 25
Flasks, old	— @ 1 05

Mining and Other Companies.

Persons interested in incorporatione will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

San Francisco, Cal., February 10, 1882.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No 60, of Fifty Cents (50c) per share, was declared, payable on Wednesday, February 15th, 1882. Transfer books closed on Saturday, February 11th, 1882, at 12 o'clock M.

WM. WILLIS, Secretary.

Office—Room 20 Nevada Block, No. 300 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, February 2, 1882.

At a meeting of the Board of Directors of the above named company, held this day, dividend No. 38, of seventy-five cents (75 cts.) per share, was declared, payable on Monday, February 13, 1882, at the office in this city, or at the Farmers' Loan and Trust Company, in New York.

WILLIAM WILLIS, Secretary.

Office—Room 20 Nevada Block, No. 300 Montgomery street, San Francisco, Cal.

ASSESSMENT NOTICE.

Consolidated Pacific Mining Company.

ASSESSMENT, NO. 4.

Amount.....Forty Cents per share
Levied.....January 28, 1882
Delinquent.....March 3, 18 2
Day of Sale.....March 27, 1882

F. E. LUTY, Secretary.

Office—Room 5, No. 330 Pine St, San Francisco, Cal.

Amusements.

BALDWIN'S THEATER.

THOMAS MAGUIRE.....Lessee and Manager.

W. E. SHERIDAN.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily

THE TIVOLI GARDENS.

KRELING BROS.....Managers

FAUST.

Eddy Street, between Market and Mason. Open every Evening.

COAL AND IRON.

1,000 TONS LEHIGH LUMP AND EGG—Ex Gov. Goodwin, Tacoma, Prussia.

500 TONS NO. 1 GLENGARNOCK AND EGLINTON PIG IRON—Ex Loch Mordart, Z. Ring, and Ben Douran.

1,000 TONS COWPER WEST HARTLEY, Ex Prince Frederick.

ALSO, IN STOCK,

CUMBERLAND COAL,

In bulk, sacks and casks.

Sydney, Scotch Splint, Cannel, Patent Coke and Welch Steam Coal.
Clay Lane and Sterling White Iron.

For sale in lots to suit, at Lowest Market Rates.

J. MACDONOUGH,

No. 41 Market Street, San Francisco, Cal.

E. BUETTNER, C. E.

Mining Engineer.

MINING PROPERTIES EXAMINED AND REPORTED ON

FRISCO, BEAVER COUNTY, UTAH.

1851. 1881.

DEPUTY U. S. MINERAL SURVEYOR.

Surveys for Location or Patent. Maps and Plans Drawn. Mining Properties of all kinds examined and careful reports made of the same. Consultations on Mining Investments. Address, THOS. W. REECE, CIVIL ENGINEER, Oroville, Butte Co., Cal. References given and required.

PACIFIC POWER CO.

Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

Inventors L. PETERSON MODEL MAKER.

Models for the patent office in wood or metal, a specialty. No. 328 Bush St., between Montgomery and Kearny, up stairs, S. F. Experimental machinery and all kinds of tin, copper and brass work.

"THE $1,000 CHALLENGE"

Ore Feeder for Quartz Mills.

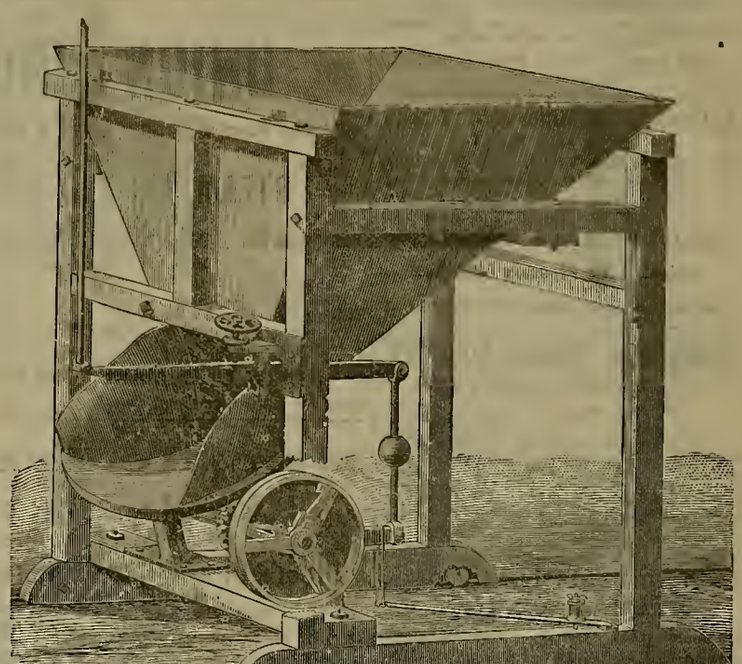
OVER 800 ARE NOW IN USE, GIVING ENTIRE SATISFACTION.

Awarded First Premium at the Tenth and Twelfth Industrial Fairs of the Mechanics' Institute.

Twenty Per Cent. More Ore Crushed with Fifteen Per Cent. Less Wear of Iron than by Hand Feeding.

The accompanying cut illustrates the recently introduced Grip, and also the Spring Attachment, which replaces the Weight heretofore used, and which are obvious improvements.

It is now fully demonstrated, after careful and long continued experimentation and practical use, that the plan upon which a perfect Ore Feeder must be constructed is that of a carrier, and not that of a shaking-table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Jerky or spasmodic contrivances will not answer the purpose for wet or sticky ores



The Challenge Ore Feeders are now in Use in the following Mills, besides many others

Soulsby	20 Stamp	Tuolumne county,	Cal.
Sheep Ranch	20 "	Calaveras "	"
Mahoney	40 "	Amador "	"
Zello	40 "	" "	"
Placerville	40 "	El Dorado "	"
Gross	80 "	" "	"
Julian	20 "	Placer "	"
St. Patrick	15 "	" "	"
Providence	20 "	Nevada "	"
Omaha	10 "	" "	"
Green Mountain	60 "	Plumas "	"
Plumas Eureka	60 "	" "	"
Bulwer-Standard	30 "	Bodie Dis., Mono,	"
Standard	20 "	" "	"
Noonday	20 "	" "	"
Bodie	10 "	" "	"
Christy	5 "	Uintah Co., Utah.	
Ontario	40 "	Parley's Park,	"
Contention	20 "	Tombstone Dis, Arizona	
Grand Central	20 "	" "	
Harshaw	20 "	Patagonia,	"
Sunshine	20 "	Idaho Springs, Col.	
Homestake	20 "	Black Hills, Dakota.	
Father De Smet	80 "	" "	"
Hidden Treasure	40 "	" "	"

Superiority of the "Challenge" Ore Feeder Demonstrated!

At the "Christy" Mill, Uintah County, Utah, the "Eclipse" Feeders, (conceived by E. Coleman) were introduced, but not carrying a regular supply of ore for the crushing capacity of the stamps, were replaced by the "Challenge," which are now running and the stamps crushing forty (40) per cent. more ore than was done by the "Eclipse."

The "Harshaw" or "Hermosa" Mill, of Patagonia District, Arizona, was also originally fitted with "Eclipse" Feeders, but after a few weeks trial they were pronounced inadequate to the work, discarded, and the "Challenge" adopted.

The "Silver King," Mill of Arizona, also removed the "Eclipse" Feeders to give place to the "Challenge."

The "Sola" Mill, of Brown's Valley, Yuba County, Cal., was fitted with "Victor" Feeders, manufactured by E. T. Steen, but proving insufficient, the "Challenge" Feeders were substituted.

Four of the "Victor" Feeders, manufactured by E. T. Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.

These cases are simply cited from among many similar instances, in proof of the vast superiority of the "Challenge" Feeders over all others.

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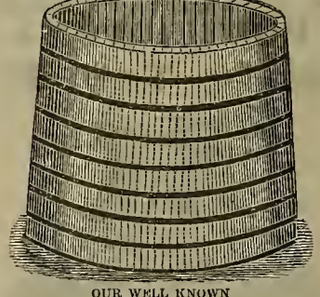

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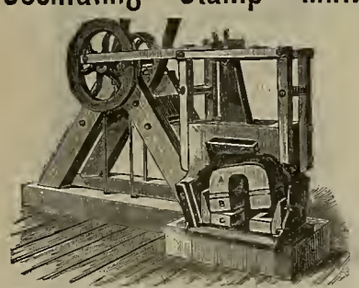
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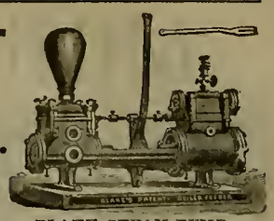

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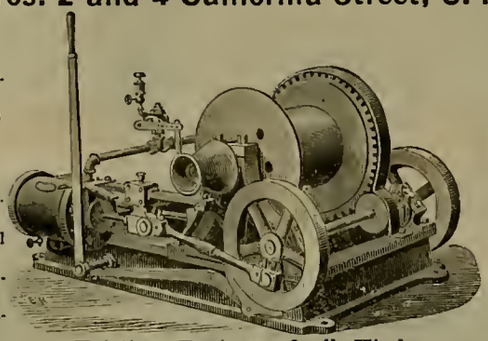

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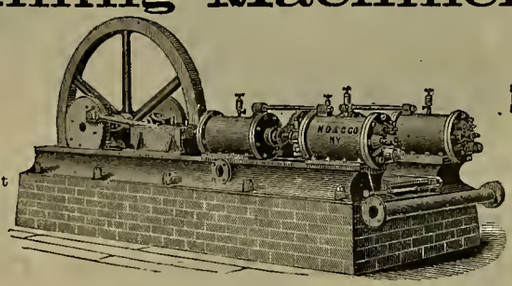

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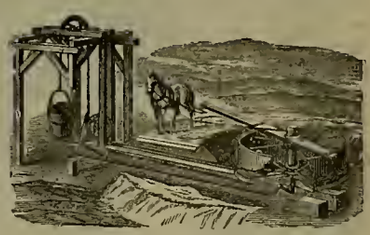

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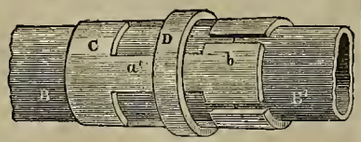

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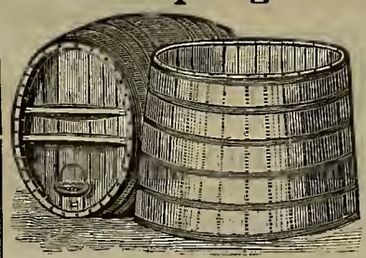

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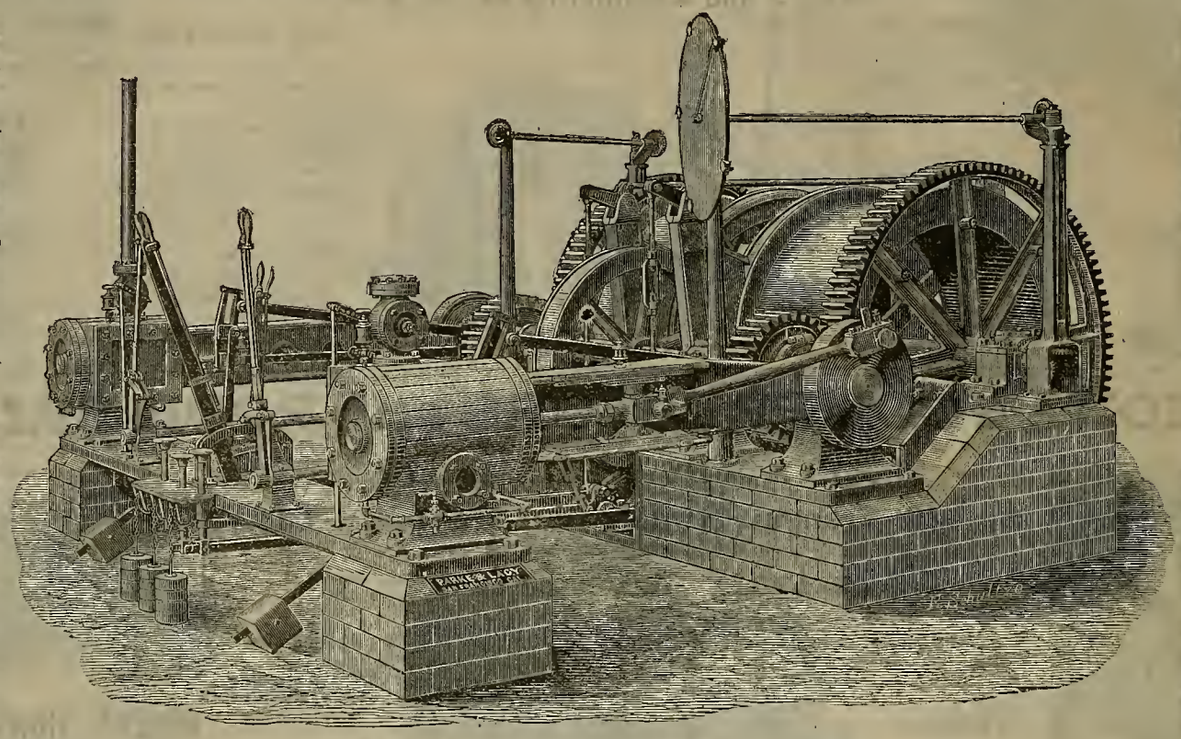

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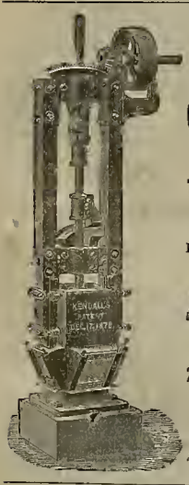

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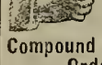

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MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO, SATURDAY, FEBRUARY 25, 1882.

VOLUME XLIV Number 8.

New Ore Smelting Furnace.

The object of the ore smelting furnace shown in the accompanying engraving is to provide means whereby impurities, such as sulphur, arsenic, antimony, etc., may be eliminated from the ores, and the noxious fumes arising therefrom be destroyed within the furnace and its adjuncts. Fine ore or tailings may be worked by it; and the furnace is also adapted for the use of carbureted hydrogen gas, in the place of ordinary fuel.

The invention, which is that of Robt. Hinvest, of New York, consists in the combination with a smelting furnace having a closed top, or dome, and provided with appliances for the consumption therein of carbureted gas as fuel; of a condenser, or series of condensers, placed intermediately between the main furnace and an auxiliary furnace and fire-place, so that the noxious fumes that pass out of the main furnace may be either condensed in the condenser, or consumed in the auxiliary furnace, by which means the escape into the outer air of any noxious gases or fumes arising from the process of smelting is prevented.

The invention consists, also, in the combination—in a smelting furnace of a closed top or dome, a series of slanting or overhanging shelves for retarding the descent of the ore, a series of radial openings into the fireplace for the introduction of carbureted gas as fuel, and a condenser, or series of condensers, and an auxilliary fireplace, by means of which combination the three processes of desulphurizing, smelting and destroying the noxious fumes are all effected simultaneously in what is practically one structure. The two figures of the engravings are vertical sections taken at right angles to each other, and similar letters of reference indicate the same parts on each figure.

The main body of the furnace, *A*, has a closely-covered top or dome, *a*. *D* is the hopper through which ore is fed, and which is covered by a self-acting gate or door, *C*, on the inside. *B* is the fireplace at the lower part of the furnace; *d* is the opening or tube through which the slag is discharged, and which serves the purpose of an air inlet for the supply of atmosphere oxygen to support combustion.

E is a condenser, one or more of which may be used, into which any sulphurous or noxious fumes which pass from the furnace are received, and in which they are condensed and held in the form of sulphurous acid. Attached to the condenser, which is furthest from the furnace, is a small auxiliary furnace or fireplace, *F*, (having an open top) in which a fire is kept up, so that any portion of the fumes which escape from the condenser or condensers are burned up therein and prevented from passing into the open air. This furnace, *F*, forms the draft exit.

H H, represents inclined or overhanging shelves, to be used when disintegrated ores or tailings are being smelted. These shelves are supported near their edges by transverse arches, and they slightly overhang each other, as shown in the drawings.

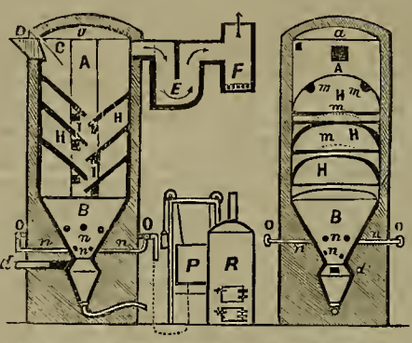
The tailings being received upon the shelves are thereby retarded in their progress while being acted upon by the gaseous heat, so that they are desulphurized and pass into the lower part of the furnace in a partially melted condition, thereby ensuring, the inventor says, the extraction of the sulfion from the ore, and freeing the same from impurities and also preventing packing in the lower part of the furnace. Openings *M*, are provided in the said shelves to assist the upward draft.

For the purpose of adapting the furnace for the use of carbureted hydrogen gas therein as a fuel, a series of radiating tubes, *N*, is provided, which enter the fireplace or lower part of the furnace from the outside, where they are connected with an annular pipe, *O*, which takes the gas from a gas holder or receiver, *P*, and through these tubes, *N*, the said gas is injected under a suitable degree of pressure into the fireplace or lower part of the furnace, and there ignited, producing a heat of great intensity.

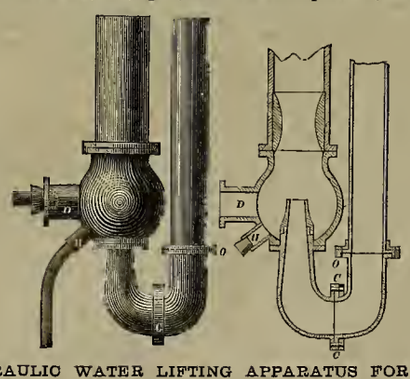
Into the gas-holder or receiver *P*, the gas is supplied from an apparatus for generating carbureted hydrogen gas which is designated by the letter *R* in the drawings, and which is constructed and arranged for producing carbureted hydrogen gas from petroleum or the hydrocarbons by means of superheated steam, which is mingled with the vapors of the hydrocarbons. The shelves may be dispensed with when the furnace is being used for smelting ore of ordinary size.

Hydraulic Mine Draining Apparatus.

The main object of the machine illustrated on this page is to go in combination with a hydraulic gravel elevator for the purpose of setting or sinking in watery locations where there is no drainage. In certain places it has been found difficult to get the elevator down to the proper level to work the mines; and, again, the elevator has become covered with water so deep that it was difficult to get at for the purpose of repairs. In such cases the "hydraulic water-lifting machine" here illustrated has served to drain the claim.



SMELTING FURNACE FOR FINE ORES.



HYDRAULIC WATER LIFTING APPARATUS FOR MINES.

This machine can also be used to advantage in certain drift mining, and in places where it will not pay to use the large machines, and work all the material from the top. The machine works on precisely the same principle as the hydraulic elevator, but it is not constructed or intended for hydraulic mining. It is intended to work in a perpendicular shaft or sump, but can be made to lift at almost any angle, and can be connected at almost any angle with the hydraulic pipe.

It has two flexible or swivel joints, *O*, *C*, which allow it to be set in almost any position, and connected with the hydraulic pipe. The hydraulic pipe is connected with the main stand pipe, and as the water passes down and up through the nozzle shown, the water from the mine is drawn up through the small pipe, *H*, and passes upward with the main body, the large inlet, *D*, being closed. In case, however, there is a good deal of water, the pipe *D* is left open also, or gravel thrown in there, too.

This machine will be found of great advantage in combination with the elevator, or in drifting where water can be obtained to drive. It can be utilized to raise the drift dirt, and also will act as a ventilator, by withdrawing the foul air from the bottom of the mine, as the machine has a strong air suction, or draft, when it is not drawing water or dirt.

When used in combination with the gravel elevator as a sump or drain, it is generally placed at the bottom of the shaft, somewhat lower than where the elevator is situated, so as to drain everything into it; and can be driven by a branch pipe taken from the main pipe that drives the elevator. It must have a cut-off, or gate, to shut off the water when not in use.

This machine is not required to run while the elevator is in operation, for that is a sufficient drain; but, as above stated, is only required when the elevator is not running. This device is small and light, is easily set and moved, and does not require very much water to run it. It will lift, (Mr. Joshua Hendy, 51 Fremont St., the manufacturer, tells us,) about as much water as is required to drive them, and will lift higher than the gravel elevator with the same pressure.

A NEW GOLD DISTRICT.—A dispatch from Victoria, B. C., says: Last summer a man named Barney Johnston went to Chilcat, crossed the Coast Range and reached a point 50 miles from Fort Selkirk, on the Yukon river at the mouth of Lewis river. There he found a gold belt running across the country, from east to west, the same as in Cassiar, Ominca and Carihoo. He prospected and obtained fine gold everywhere along the line of this belt, which, of course, he did not explore fully, as it had taken him a long time to get in, and very little of the season was left to work. He saw that all presented a first class appearance. Indians and fur-bearing animals are numerous in the country, the altitude of which is not so great as that of Cassiar and the climate better. The diggings lie about the 60th parallel of latitude. North of this degree the boundary of British Columbia does not extend, and, although the new gold field lies in British territory, it undoubtedly owes allegiance to the Northwest Territory.

Academy of Sciences.

The regular meeting of the Academy of Sciences was held on Monday evening last, Prof. George Davidson in the chair. The following were elected life members: Walter E. Dean, A. K. P. Harmon, Isaac L. Requa, John G. Kellogg, A. W. Mauning; and resident members elected were F. A. Hyde, Henry Ferrer, M. D., Charles G. Hooker, Charles E. Apponyi, William F. Nolte. The following were proposed for life members: Henry T. Soott, Wm. T. Coleman; for resident member, Arthur A. Smith.

Donations to the museum were as follows: From the Alaska Commercial Company, a handed seal from Behring sea; from W. G. W. Harford, a Mexican ant-eater; from Dr. A. F. Sawyer, a fine classified collection in glass cases, containing 224 samples of useful vegetable products, including woods, seeds, fibres, etc.; from E. F. Lorquin, two meadow larks; from Frank Mank, agent of S. P. R. R. at Monterey, Cal., a long section of kelp, washed ashore, and found filled with small fish resembling sea perch. These fish were packed in the kelp as close as they can be stowed. He asks the academy: "Do these fish hibernate in the kelp, or did they crowd in there to escape enemies?" From Capt. Ferdinand Ciprico, a dried and mounted flying fish, caught in latitude 11° south.

Prof. Davidson announced the death of ex-Lieutenant-Governor Purdy, whom he said had, in early days, presented many valuable gifts to the Academy. He then spoke of the scientific labors of Prof. Henry A. Ward, of Rochester, N. Y., whom he heartily endorsed as one who had done more than any other man within his knowledge, to facilitate and encourage the study of fossil remains, and their proper distribution among the various scientific museums of America and the world. Prof. E. T. Cox endorsed Prof. Davidson's remarks and said, in the East Prof. Ward was regarded as a savant of great merit. Prof. Ward then spoke for an hour, giving an interesting account of his life-work in collecting specimens. Prof. Ward has a collection here in this city amounting to upwards of 150 tons, which he will shortly exhibit. It is to be hoped some of our rich men will see thet they will be kept here. We shall speak further on this subject hereafter.

At the next meeting, the first Monday in March, Prof. Joseph LeConte will read an interesting paper; also, Prof. Davidson will treat of temperature of sea water on this coast during the past nine years, and Prof. Ward will speak on the mammoth and other monsters of past ages.

LUNING.—Thie new and springing town is growing rapidly. Already town lots are staked off and streets laid out with all the style of a large city. Several new buildings are now in process of erection, and before 60 days Luning will be a place not only in name, but in reality. It is the center of a rich mining district and the depot for all supplies for Grantsville, Ione, Ellsworth, Downeyville, Cloverdale and the different camps to the eastward. Gillis Mountain, Garfield and the mines adjacent all look to Luning for supplies. The mines are proving rich wherever any work has been done and the chloriders are all heppy.—*Candelaria True Fissure.*

CHISPA.—It pays to perambulate the streets of this modern Jerusalem after a rain-storm, not on the sidewalks, however, not staring into shop windows nor gazing at the stars, but by keeping your optics directed earthward. Last week, Andrew Blize, Esq., while passing along Main street near Danz's wagon shop, picked up a handsome little nugget of gold worth $16. After a rain-storm it is no uncommon thing to pick up nice little specimens on our streets. Don't talk to us of planked streets or cobblestone pavements.—*Calaveras Chronicle.*

COLORADO miners are looking toward Utah for investment, and they think Salt Lake is the next city to receive a big boom.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Inyo County Mines.

Smelting Lead Ores.

EDITORS PRESS:—To use an oft-repeated phrase, Inyo county has a black eye as far as its mining interests are concerned. Many efforts have been made during the past three years to dispose of really valuable mining property, some as prospects only, and some as partly developed mines; but with one or two exceptions all efforts have failed to induce capital to take hold. The word has gone forth that there are no mines in Inyo county. Now we are prepared to dispute that assertion, and not only dispute it, but claim that Inyo has more and better prospects than any other county in California. Why is it said that we have no mines? But very few mining men will come here to see if we have or not, and most of those few come prejudiced. They make up their minds before they come that there is nothing here worth looking at, and when they get here they will not take any pains to go around and see what we have to show them for fear that they might see a good mine, and have to change their minds. "There are none so blind as those that will not see."

It is true there were a number of failures here in mining ventures some twelve or fifteen years ago. Two or three mills were built at great expense before any mines were found to furnish the mills with ore. Smelting furnaces were erected by parties who were totally ignorant of the smelting process. They made disastrous failures, not through a want of ore to smelt, but through a lack of skill in handling it. Bad management and extravagance finished the business, and the spectral wrecks of old mills and furnaces stand here to-day as monuments of former failures. These failures occurred at a time when but comparatively little was known of milling ores, and much less of smelting. It is no wonder that men who never before saw a smelting furnace, and knew absolutely nothing of metallurgical operations and the chemistry of ores, should make complete and utter failures of their attempts to smelt ores. Of course the fault was charged to the ores, or want of ores. They could not be smelted, or there was none to be had after the furnaces were built. And so Inyo got a black eye from which she has never recovered.

Smelting lead ores is now reduced to a simple process. Any ores can be smelted if they contain from 35% to 50% of lead. The skillful smelter knows the compositions of his ores, and he makes the combinations necessary to produce the desired result. As an instance of how smelting works were conducted here a few years ago, the works at Swansea on Owen's lake are a good example. In the first place, the furnace was built in a hole, or on the lowest spot of ground to be found in the locality. There were no slag dumps; it had to be wheeled out on level ground, and piled up. A large quantity of ore was put through this furnace, and considerable bullion shipped, notwithstanding the rude way in which the whole business was managed. The interesting remains of the Swansea smelting works now consist of the slag pile. Probably 3,000 tons of this material is now lying near the old works, which the writer has examined a number of times, taking samples and making assays of several different kinds of this slag. The result of these investigations shows percentages of lead from 15 to 50, average about 30%; and in silver, from 15 to 70 ozs., average about 30 ozs. per ton. There are besides in this slag pile tons of bullion in the shape of nuggets of lead weighing from 200 grains up to 1 lb. each. Comment is unnecessary.

In almost every case where mines in the Inyo range have been developed to any considerable extent they have proved to be permanent and valuable. The Union Con. Mining Co., of Cerro Gordo, have run out of their furnaces over $13,000,000 worth of bullion, and there is good authority for stating that when the company stopped work large bodies of ore were left standing in the mine, which had reached a depth of 900 ft. The famous Ygnacio mine now shows thousands of tons of high-grade ore. The San Lucas is another of the same class, and still there is not a half dozen picks being struck in the whole district. The place is nearly deserted and dead. A very few of the old timers who hold interests still "stay by the pot," and hope for better times.

In the Beveridge district, which adjoins Cerro Gordo on the north, the rich Keynot gold mine was discovered about a year ago. It has turned out over $125,000 worth of gold, with a little 5-stamp mill, and the mine still improves as it is opened. Several mining men have been here to look at this property, but as it was in Inyo county they concluded that it was not a safe thing to invest in. The Brown Monster mine, in the Russ district, which has reached a depth of 500 ft. and has a vein of gold quartz 6 to 8 ft. in width which averages $25 per ton is also in Inyo county, and for that reason it cannot be of any value. The Hirsch mine, in the same locality, is another valuable gold ledge. These two mines are most conveniently situated for working and have a splendid water power, furnished by the Owen's river, within three miles of the property. These ores can be mined and milled at a cost of $4 per ton.

The Union district, adjoining the Russ on the north, shows a great number of splendid prospects for smelting ores as well as milling, gold and silver ledges. But little work of development has been done in this district, except short shafts and tunnels of from 20 to 100 ft. in extent. The Union is the most accessible and open of any of the mining districts in the Inyos, and with every facility in the shape of wood, water and good roads that could be desired. The great drawback to this district is that it is in Inyo county. Bishop Creek comes last on the north, with its Poleta and other rich gold mines. The Poleta was sold a few months ago to San Francisco parties for $30,000, and the work of development has been going steadily on since the sale. A depth of 340 ft. has been reached, and the shaft shows rich ore from top to bottom. The districts of Darwin, Lookout and Panimint, in the southern part of the county, have not been mentioned, as the object of this letter is more to show the mineral wealth of the Inyo range from Cerro Gordo north. X.

The Piru Mining District.

M. G. Fitzgerald has been prospecting for a long time in the Piru mining district, where he has valuable interests. He states that he is an old prospector, and has seen every mining camp of any reputation on this coast, from Rogue river to the Sonora line, and has more faith in this, as a rich mineral belt, than any of all the great number it has fallen in his way to examine. It takes its name from Piru creek, which runs through it in a southerly direction, carrying, according to the season, from 100 to 1,000 inches of water, miners' measurement, and has placer diggings along the banks that have been profitably worked. It is about 25 miles in width by 50 in length, and is a strongly-marked mineral belt, containing mineral veins of almost every kind—such as gold, silver, copper, lead, tin, iron, bismuth, antimony and coal, with strong indications of coal-oil. It is abundantly supplied with timber of all kinds, water and grass. It has never attracted the attention of that class of men who get up booms in mining camps. Those who frequent it are poor men who go there to make a raise, working the rich gold quartz they find in arastras. It is frequented by a considerable number of such persons who go there with no speculative ideas whatever. They are supplied from Los Angeles, and their trade is worth to the merchants of that city from $3,000 to $5,000 per month. The district is principally in Ventura county, and the part around which the principal interest centers and the work is mainly done, is distant 55 miles from Bakersfield and 112 from Los Angeles. The principal lode is called the Frazier mine. During the time it was worked, a period of eight years, until operations ceased on the 31st of October, 1879, because of litigation arising from disputed ownership, it is believed to have yielded about $1,000,000 in gold. The difficulty is now said to be on the eve of settlement, and it will be worked by more improved methods and on a larger scale than ever. Hitherto it has been worked by men not well qualified to conduct any business successfully. The vein varies from two to 16 ft. in width and will average eight ft. The ore contains a small percentage of silver which seems to increase with depth. At the depth of 250 ft. this amounts to $6 per ton, while there is only a trace on the surface. It is filled with iron and other sulphurets that assay from $300 to $3,500 per ton. They are all saved. There is no means of treating them at the mine. But the yield in free gold is from $15 to $25 per ton. A ten-stamp mill—not a very good one—run by steam power, is connected with the mine. There are many other claims in the vicinity that are successfully worked, yielding from $500 to $3,500 yearly, by the arastra process. One of these, the Castac, a small rich lead, has yielded about $15,000. This, with several others of a similar character, were shut down for several years because of the death of the owner, but recently resumed successful operation. A two-stamp mill and an arastra are attached to the property. Some of the most valuable leads cannot be worked by the free milling process, because they contain lead and therefore lie idle for the present. One of these, the Mountain Chief, a large, well-defined vein, gives an average working test of $31 in gold and $40 in silver per ton. The ore is also charged with rich sulphurets. Probably one of the most valuable leads in the district, if it were in some other place, is a vein of magnetic iron, 50 ft. in width, containing 52% of this useful metal. From the account of Mr. Fitzgerald, it evidently is a good place for those to examine who feel disposed to devote their time and money to acquiring and developing valuable mines.—*Kern County Californian.*

AN OIL WELL IN THE GULF OF MEXICO.—A curiosity in the Gulf of Mexico has been discovered. It is a harbor in the open gulf, fifteen miles from land. A kind of oil is thrown up by the processes of Nature, and rests upon the surface of the water in a thick scum. The effect of the oil is so great that even in the severest storms the sea in this peculiar harbor is comparatively smooth. This is so well known that when a storm approaches small vessels run for this "oil pond," as it is called, and ride out the gale in safety.

Our Quartz Mining Industry.

We are highly pleased to notice that some of the Georgetown smarties—those who apparently think that what they don't know about the hidden treasures isn't worth knowing—are beginning to fall into line with the little army of progressive spirits who have been laboring unceasingly to open up and bring to the notice of capital our mineral and other resources. Probably there is not another town on the mineral domain of this grand Pacific coast which contains so many pull-back people as there were, until recently, in Georgetown. But they cannot win, no matter what their motives may be, whether envy or disappointment, or a lack of practical experience in the economical methods of prospecting and working low-grade ores and gravel. In nearly every instance, the class of whom we speak are old-timers, men accustomed to rich placer and seam diggings (yet, to the credit of many of our early miners, we are proud to find them among the most enterprising and successful of our progressive miners), but it is a well-known fact that nearly all of the quartz discoveries made within the past few years were by men who came to this country since the palmy days of placer and seam mining. Many of the good old pioneers were aware of the existence of gold-bearing ledges, which prospected only a few small colors—probably $12 or $15 rock—which they little thought would, in the near future, prove a better property than their ounce diggings. Men accustomed to making money easy and spending it freely, are usually not the men to see a fortune in quartz which prospects as low as $5 or $8 per ton, and even should they see it, few have the patience to stay with the lode and develop it into a good property. To-day there are golden opportunities in undeveloped quartz mines all along this divide.

A few years hence many will regret they did not prospect more carefully and extensively their claims. Of course we know that it's not all gold that glitters, and that every ledge which shows a prospect will not prove a paying property; but we do claim that a little more energy on the part of claim holders will surely add several more good mines to this district. Then in the face of this reasonable view, and the fact that several new mines and mills have already started up in this county, is it not high time these "anti-miners" and "anti-progress" men, or growlers, or whatever appropriate name you may call them, were seeing the folly of their course, and taking an active part in the encouragement of bringing to light the millions of hidden treasure which no sane person can reasonably doubt lies within a practical working depth within the limits of Georgetown district alone. Shall we not increase our energies and explore our mines to a reasonable depth, rather than linger along for years, and finally leave the work and its fruits to the experienced quartz miners of Grass Valley and other go-ahead camps, who are already looking this way. We do not wish to portray this subject in a false light, nor as an enthusiast. We are simply trying to show up our mining advantages as they are, and giving a few words of encouragement to our miners, as well as chiding those who appear to have a mania in crying down our quartz mining industry. Time is certainly demonstrating that these anti-miners don't know it all.—*Georgetown Gazette.*

THOSE OBSTINATE ORES.—All along the Sierra, from the northern end of the State to their termination in the south, veins of ore bearing precious metals have been discovered. Those on the lower slopes have proven rich and remunerative, but those found along the summits, as a general thing, have proven failures. The ore-bearing veins of the upper regions are large and plainly defined, are easily mined and return fabulous amounts under assay, but when put to a milling test have signally failed. The excuse for failure by milling process has always been that the ores were rebellious and would not yield to the ordinary processes. Whether this be true or not, the fact exists that the ores do not pay by mill process. Meadow Lake, Silver Peak, Mineral King and many other mining districts stand as witnesses of the unfortunate fact. It does seem that somebody will soon find the key to unloose all the mineral wealth that lies locked in the ore veins along the summit of the Sierra in this county, and we have faith that in time the precious metals will be extracted from them and turned loose to enrich those who are bold enough to develop and work them.—*Nevada Transcript.*

WILD-CAT MINES.—It seems that there are a number of wild-cat mining schemes in Idaho. The local mining journals generally take an attitude of decided opposition to all such swindling. Apropos of the New York and Idaho Gold and Silver mining company, and the Golden Horn Mining and Milling company of Idaho, the Yankee Fork *Herald*, of the 26th ult. says: "There are any number of good mines in Idaho for sale at reasonable figures, and it is a detriment to the mining interests of the Territory to foist wild-cats upon an unsuspecting public. Every newspaper in the mining counties should sit down on the 'wild-cats' and crush them out of existence. We propose to do it, and don't you forget it. Some of Idaho's camps, and none more notably so than Atlanta, have been set back by just such swindles as that mentioned above, and it is time there should be a stop put to it."

Copper for Old Iron.

A Mine That Makes the Trade Even in Chrome Iron.

Two years ago, a mine was operated by Wm. Utter, at Campo Seco, near Milton, says the Stockton *Mail;* water came in and work was stopped. To keep the large iron-bound and iron-baled bucket used to hoist rock from drying up and falling to pieces, it was let down into the water. Next season when it was drawn up, lo, a miracle! It was copper-baled! From this has sprung quite an industry, and the mine has been sustaining itself from water and ore ever since. The water contains an acid which has the property of taking into solution the particles of iron thrust into it, and it has also copper in solution, which is let go particle by particle as the iron is picked up. It is a simple chemical exchange, and this mine may make another profit still, if it will get another chemical into the water which will make the acid lay down the iron which, as a black flood, the water carries down into the Stanislaus river.

The copper industry consists in taking bundles of scrap iron and tin to the mine, where it is thrust into vats of the water caught up, in which the metals are soon changed into copper, the residue of the iron taking the form of a black stream and flowing away. To make sure of making the water swap all its copper for iron, which it is glad to do without boot, one vat is placed below another down the bank to the river, and when the water escapes it has eaten its fill of iron, and left pay for its meal in genuine copper.

There are other mining interests in that section which are paying also. One Barrett is opening the Napoleon mine for a New York and Philadelphia company. It is situated about 10 miles south and east of Milton, and has chrome iron ore which carries gold and silver in greater or less quantities. Utter has a big pile of like ore, about 1,000 tons, at Milton now awaiting shipment to San Francisco, en route for Swansea. The finer portions of the ore are sacked, the rest is in bulk. It has been found there is gold and silver enough in the ore to pay all transportation from the mine to Swansea, which leaves all the other valuables of the ore for profit. At Swansea the coarser portions of the chrome ore is ground into paint, and the better portions, after taking the gold and silver out, is for dying green and changeable silks, giving the finest and most durable colors.

There are at Oakdale 1,000 tons of this chrome iron ore which has been brought in about 25 miles from a mine near the Sonora road by Kruse & Euler, and the ore has the same destination as that above mentioned.

The Mines on Military Hill.

The Tombstone *Epitaph* says: Military Hill is a locality little heard of in the mining reports of this district. This is a high, limestone hill, about one mile south of and a little to the east of the Grand Central mine. At its northwestern base is the Emerald mine, somewhat widely known in mining circles. Going south, skirting the western slope of the mountain, we find the Side-wheel, Huguenot, Corona, Rattling Boy, Wampum and Silver Plume, all prospects of great promise, and particularly the Side-wheel and Rattling Boy. The former of these two last-named claims has a continuous outcrop of rich manganese ore throughout its entire length. Assays from the surface of this vein range from $18 to over $500 per ton. This vein where exposed in two shafts, the one six ft. and the other 10 ft. deep, is fully 2½ ft. thick, with indications of steadily widening. The dip of the ore appears to be to the east, or into the mountain.

Going around to the south and east slopes of the mountain, we find the Big and Little Pedros, Idaho, Ivanhoe, Mattie H. and Honeycomb, all good prospects, and more particularly the two Pedros. Upon these two locations there is a most remarkable mineralization of the surface. It seems that almost every crevice received its share of the precious metals during the process of deposition. Another peculiar feature is that upon the eastern slope the veins all dip west, or into the heart of the hill, which fact, taken in connection with the western veins dipping east, inferentially would lead one to expect a mammoth deposit of rich ore under the center of the mountain. A good deal of work has been done upon the Pedros, developing a fine showing of rich mineral. One shaft sunk on an adjoining claim, about 50 ft. east of the Big Pedro, has developed a strong, well defined lode, with a strike directly through the heart of this location, and a little to the south of the summit of the mountain. There is also a large outcropping of quartz, carrying rich sulphurets of galena, about 200 ft. to the west of this shaft, which cropping is on the Big Pedro, and in our opinion is strong presumptive evidence of the continuity of this ledge through the mountain.

Upon the northern summit of the hill is the Green Cloud mine, upon which there is an incline shaft down about 100 ft., developing a strong vein of ore, much of which is very rich. We saw about thirty tons of first-class ore on the dump, with, perhaps as much more second-class. This is a very good showing for a valuable mine, and demonstrates the fact that Military Hill is one of the most thoroughly mineralized portions of Tombstone district. Time and thorough development alone can tell the amount of latent wealth hidden away in the recesses of the silurian landmark.

MECHANICAL PROGRESS.

The Blacksmith's Forge.

A blacksmith's forge is a simple affair, aad it is commonly believed that whon you have seea ono you have seem them all. A blacksmitb's shop is a common place matter. There does not appear to be any room for the display of inventive ingenuity either in its arrangemeata or its appointmenta. Every blacksmith will tell you that blacksmitha' shops are abont the same everywhere, and that his trado of all the mechanical parsnita admits of the smallest degree of individuality. Anyone who would dispnte these commonly accepted facts woald probably run foul of the entire craft, and yet we propose doing that very thing. Further, we propose to advance argaments in proof of the assertion that there is quite as much room for inventive ingennity in the arrangement and equipment of blacksmith shops as in any simila.· branch of the mechanical trades. In fact, we bclieve there is far more room for the display of taste and skill in this line than in some of the trades concerniog which volumes have been written. Yet the blacksmith's art does not possess a litcrature, because, we auppose, there has been nothing for authors to write about. In a trip of some 1,500 miles recently uadertaken, in which we visite dsome of the larger cities of the conntry, as well as a number of the smaller towns, we examined some 25 or 30 blacksmith's shops.

We took special note of the forges and tool benches; of the shop system; of the arrangement of the forges in the shops; of the position of the water and coal belonging to each forge, and of the various other points which would he obssrved hy one in search of practical information. We did not find any two shops in which the forges were arranged in the same manner. We did not find any two shops using the same style of forge, nor the same style of tool benches and tool racks. The methoda of the several foremen were as unlike as the several shops. If we had made sketches of each different forge, and of each different tool bench; if we had made diagrams of the arrsngement of all of their shops; if we had made notes of the different methods we saw employed in doiag the same kind of work, aad had printed cuts and description together in this issue, we would have made a number whicb would have been really sensational in character. And yct blacksmiths declare that they have nothing to write ahont. Each one supposes no one is interested in his methods and appliancss. This is a great mistake, as we happsn to know by practical tests. As we went from shop to shop we made it a rnle to tell the blacksmith of the place we were visiting something ahout one of the shops we had previonsly seen. Our remarks always commanded attention, and we never failed to excite enough interest to prompt some one to ask questions. If we happened to illustrate onr description hy an impromptn drawing they were all the better pleased. It was impossible for us to make the sketches as above suggested, nnd therefore our readers have not the opportunity of seeing how 25 or more shops are conducted. It is not impossible, however, for 25 or 50, or even 100 blacksmiths located in different sections of the country to send us diagrams of their shops, sketches of their forges and their tool henches and descriptions of their methods of workings. We are ready to make engravings and to print sucb descriptions. By this means our readers can compare notes. In one sense they can visit each other's shops. The trip we have above mentioned was to us quite interesting and instructive, and the counterpart of even more extended trips which our readers are able to furnish for themselves cannot fail to he profitable.—*Blacksmith and Wheelwright.*

New Departure in Finish of Railroad Cars.—A correspondent of the *Railroad Gazette* says: "The time is evidently ripe for a new standard of taste and a new method of finish in cars, and we may as well make the best of it. The movement is very plainly in the direction of greater simplicity, one wood simply ornamented hy cutting into its substance by hand work or hy machinery. Let us hope that it will take the direction of unobtrusiveness of general effects which shall not pusb themselves on our attention hy great contrasts or excessive 'style.' The car, which is simple and unobtrusive, will not have to he rebuilt in the next 5 or 10 years because its style bas become ridiculous, hut I fear some other cars will be under just this necessity, for the American people are changing in taste, as no mass of people ever did in so limited a time. It is, therefore, wise to keep on the negative side of the movement—simplicity and neutral tints—until the people have tired of the subject, and the craze has done its work and left some eort of etandard as a legacy to the future."

Glass Roofing.—In a paper publisbed in Germany hy the Hanover Society of Eogineers aad Architects, the comparative advantages and disadvantages of glass roofing are thoroughly considered. Hail, it appears, is not so damaging to such structurcs as is commonly supposed. It is seldom destructive of glass an eighth of an incb thick, and a thickness of a quarter of an inch is almost absolutely safe. The use of glass more than half an inch thick, bowever, has proved objectionable for roofing purposes, as it is said to he liable to spontaneous fractnre.

Car Construction.

A correspondent of the *National Car Builder* makeasome timely snggestions in regard to railroad car construction, from whicb we summa rise as followa: That we are on the eve of a radical change—perhaps *reform* wonld bo the most proper term—in railway practice, is evident even to ordinary observers. Any one whose iaterest, habits and training lead to a close observation of what is hsing done in the shops and on the roads, will notice the indications of snch a change on every hand. The initial movement in some directions has already hegun, snd preparations are making for a "jump, step and leap" in others.

Ono of the first of the more recsnt requiromants of an exacting nnd fastidious puhlio is faster trains. Fifty miles an hour will not do, and the permanent way and motive power of some roads have been improved and brought to a degrco of perfection by which a rate of speed has been attained in short rans, and under favorable conditions of grade, alignment, etc., of 76 miles nn hour. We have also a record of 111 miles beiag "done" frequently, almost daily in fact, at the rate of 68 miles an hour; and hundreds of miles are rnn at 60 miles an hoar. It is only on the best roads that these feats are performed. But there are thousands of miles that caa easily he put in condition to meet almost any demand for fast runniag that may be made; and many capable and enterprising managers are already giving their attsation to the matter. The first thiag to he looked after is the permanent way, next the motive power, and lastly car rolling stock.

In respect to the latter, it may he said that passenger oars as now constructed, are so well adapted to fast rnnniag that hut little change is needed: but some improvements may be necessary in order to lessen the destructive effects of collisions at high velocities. This may he done to a considerable extent by an improved constraction of the frame-work of cars. To prevent telescoping, the coupling mnst he hstter; to prevent the doubling ap and splintering of car hodies, the sills mnst be improved. Perhaps a combination sill made of wood, angle iron and channel hars strongly braced diagonally and strenthened laterally, with an abundance of tie-rods, wonld obviate much of the crushing effect of collisions and derailments.

With the increase of spsed the weight of cars is also increased, which may render it necssary to increase the size of axles. From 12 to 18 accidents are reported monthly from broken axles and wbsels, but more than 80% of brokeu axles are on freight trains, while the percentage of broken wheels on freight cars is not more than 60%. But, consideriag the numher of cars in use in each dspartment of the ssrvice, tbe numher of hreakages is largely on the side of passenger cars. This cannot he dne to overloading, but may be charged to shocks received in coming in contact with guard-rails and frogs at high vslocities. Fancy a strong man with a heavy sledge giving repeated hlows on the inner side of a wheel flange in the direction of tbe axis of the wheel. We should expect him to break the flange, at least, with a fair prospect of produciag a fracture in some other part of the wheel, and these hlows are light as compared with the ponnding the wbeels receive when hacking and gonging the ends of badly constrncted and misplaced guard-rails and frogs.

Tests of the Quality of Steel.

Almost every hlacksmith has his own rule hy which he determiaes the qnality of the steel which he uses. That these tests or rules are somewhat empirical in character is evident from the fact that a prejudice against a certain make of steel will often keep it out of nse in the shop, no matter what its actual merits may be. Some stories are told of the stratagems resorted to hy owners of works to accomplish the introduction of American steel at the time when all mechanics were violently prejudiced against it and in favor of the Eoglish article. Prejudicss of this kind, however, are not peculiar to hlacksmiths, hut extend to various other trades and industries.

Some of the tests to which steel may be snhjected in order to determine its merits may he mentioned, although it is somewhat difficult to describe the indications by which an opinion is formed. They can he acquired only hy practical experience. In the case of what is known as hlister steel it may he generally considered as of the best quality when the blisters are somewhat inferior in sizs. Where there are hnt few hlisters, and tbose of an irregular size, it is safe to pronounce the steel of an inferior quality. What is sometimes called natural steel, German steel and cast steel are always had, if siogle sparkling crystals show themselves in a fresh fracture. Generally speaking, any sparkling steel is had. It is merely hard, impure iron. A good quality of hardened steel on fracturing presents a dead silvery appearance, and is of an inferior white color. In soft shear steel, the fracture has a hluish tint, and in soft cast steel, it is of a grayish hue. In German steel and natural steel, the fracture has a soft, bright, gray tint, often inclined to fracture in the center of the har. Of course, the proof of the pudding is in the eating of it, and an actual test of the steel in hand is a much more satiefactory way of determining its quality than any examination of its appearance hefore working.—*Blacksmith and Wheelwright.*

SCIENTIFIC PROGRESS.

Advance in Photography.

Recent advanoea in photography bave not only enabled us to produce plates that are very mnch more seasitive to light than any previously known, but the processes bavo bsen so simplified that the tonrist can easily carry with him all the artioles necessary to field photography in a very compact and convenient form. Formerly it was neoessary to carry a stock of chemicals and some apparatus, aad the plates had to be prepared and made sensitive on the spot. Now, however, dry platea can be purohased, at a reasonable cost, whicb will ksep for any length of time, and whioh are ready to receive the impression in the camera at any moment. Moreover, thoy are far more sensitive than the ordinary collodion plates in commoa nso, and are particularly suitable for landscape work. All that is necessary now for the tonrist to carry witb him is a small oamera aad a set of the dry "gelatino-bromide" plates. The exercise of good taste and judgment will enable the amatenr to obtain most excsllent results in landscape photography.

The value of the dry process for soientifio explorations cannot he overestimated. The process of preparing the gelatino-bromine plates is very simple. A solution of gelatine is first prepared, to which a small quantity of bromide of potassinm is added. A solution of nitrate of silver is than poured in, in a dark room, and the whole is maintained at a moderate temperature from one to four days, in order to render the mixture very sensitive to light. Glass plates are then coated witb the solntion, driad thoroughly, and kept in the dark nutil they are exposed in the camera. It is hardly premising too much to say that the gelatine process will he the principal process of the fnture, for already it is hscoming very popular. However, for very fine work, such as glass positivss, that require very sharp lines and clear lights, photographers must prepare their own plates, for those that are sold are not always carefully made. Among the improvements in paper prints the platinum process deserves especial mention, owiag to the excellence of the results and their permanence. The dark parts of the prints are of metallic platinum in a very finely divided condition. Such prints can never fade or lose any of their original brilliancy.

Fertilizer Experiments.

In the discussion on fertilizsrs, at the recent meeting at Newtown, Conn., Mr. Sedgewick, of Cornwall, said he thought that Dr. Atwater's experiments had saved the farmers a great amount of money hy tsaching fertilizer manufacturers that less nitrogen is required for many crops than had formerly been supposed. Nitrogen is the most costly ingredient used in commercial fertilizers, and the most difficult at the present time to ohtaia. It would he wasteful, therefore, to use a greater qnantity than is really needed, and such waste is exceedingly costly to the farmer. As it is found that less nitrogen is required, the price of fertilizers has been gradnally droppiag in market, and this gain is greatly to the benefit of the farmer. It enables him to huy more, and to nse more with a fair prospect of ohtaining a profit. One objection to the use of guano, he believed, was that it contains a larger percentage of nitrogen than is needed, and consequently a larger proportion than farmers can afford to pay for. A saving of 1% in the amount of nitrogen in a ton of fertilizsr will cheapan the cost about $4. He thought the most profitable way to use fertilizers is in connection with stable manure, the fertilizers bsing compounded in snch a way as to make the manure and fertilizsr together just meet the wants of the crops to he grown. Exactly how the nitrogen is taken by plants, he did not attempt to explain, hut it is evident that soil which is well filled with the tops and roots of clover and other plants contains a large amount of nitrogsn that the growing crop will in some way appropriate.—*New England Farmer.*

Effect of Electric Lighting on the Demand for Gas.—The *Journal of Gas Lighting*, in a review of the past year, says: "Perhaps the most positive and ahiding result of the rage for electric lighting in public streets is the increase of gas consumption which inevitably follows the removal of the electric lamps, or is insisted upon in districts adjacent to those occupied hy the electricians. The old style of street lightiug, with five foot burners, or even worse, will no longer satisfy the puhlio in husy thoroughfares. More light is demanded even from gas, and there is consequently a large and growing use for high-power gas burners. It is fortunate for the intereste of gas ligbting that the opportunity has not been allowed to pass fruitlessly hy the manufacturers of gas lamps. Numerous inventors, such as Herr Frederick Siemens, Messrs. Sugg, Bray, Wigham, and, latest of all, Mr. Douglass, bave demonstrated that the modern demand for better means of lighting is capahle of being amply satisfied by ordinary coal gas alone. Whether electric lighting eventually succeeds in eatablishing itself or not, it is certain that it has given a great impetns to tbe business of gas ligbting in the past year."

Oxygen as a Source of Energy.

As is well known, the higheat temperatures are obtsinedhy combustion—that is, by the combination of other hodies with oxygea. Since oxygen is contiaually inhaled and oonsnmed by animals during life, we are ohliged to consider this as the source of heat and force. We have here a problem which is open to discussioa, namely, whether the energy liberated hy the combustion was originally contained in the oxygen or in the other substances. It appears as if the latter assumption was generally acceptcd; at least, statements are oftea met with, snch as, for iastance, that coal contains the heat of the sun which has hsen stored up during thousands of years. Although we cannot at present, with the means at our disposal, defiaitely solve this problem, it can at least ho shown that the statement has little in its favor. The dscomposition of carhonio acid by the influence of the light and heat of the sun is effected in such a manaer that the carhon is employed in the formation of the compouads of which the plant is hnilt up, while the oxygen escapes into the atmosphere. Now, we know that solids contain the least energy, becaass it must be supplied to them in the form of heat in order to convert them into the liquid or gaseous state, while on the contrary, heat mnst he withdrawn from gases to condense them to liquids or solids. Oxygen is oae of the most permanent gases, and must therefore possess an enormous amount of energy, while carhon, on the other hand, heing one of the most difficultly diffusible and volatile hodies, can oaly contain a little energy. This makes it extremely probahle that the force of the sun, taken up hy the plants, is not stored in their hodies, hut in the free oxygen of the atmosphere. Hence the latter is to be considered as the iaexhaustihle source of power on wbich man and animals draw, and in the carhon we possess a valuahle aid for making this energy, contained in the oxygen, available.—*Popular Science Monthly.*

Electrical Ball Finding.—Prof. Bell has snhmitted to the Paris Academy another electric method (in addition to that of the induction halance) for detecting a projectile in the human hody. It consists in inserting a fine needle near where the hall is supposed to he. This needle heing connected by wire with one terminal of the telephone, while a metallic plate laid on the skin is connected with the other terminal, when the point of the needle reaches the hall a current arises (the ball and the metallic plate naturally forming a couple), and a sound is heard in the telephone. The needle may he inserted in several places with little pain, and the pain may be prevented hy means of ether spray. The method has been tested on a piece of beef containiag a ba'l. Contact of the needle with hone gave no sound, hut there was a distinct sound whenever the hall was reached. The arrangement may he modified hy introducing a vihrator into the circuit; a musical sonnd is then heard when the needlo meets the hall. The circuit may also comprise a weak battery. In this case there is a sound from the moment the needle enters the skin; hut at contact witb tbe ball, the sound is greatly intensified.

A Fog Bow Before Sunrise.—The phenomenon of the ordinary rainhow is familiar to every observer of nature. White fog-hows, or "fog-eaters," as they are called hy the sailors, are frequently visihle in localities favorable for their formation; and they are generally regarded as indications of clearing weather. "A fog-how was observed," writes Mr. H. C. Hovey, "on the morning of the 8th of January, from my residenca on Fair Haven hights, near New Haven, Conn., at the moutb of the Quianipiac river, and about 100 ft. above the sea level. No rain was noticeable in any quarter, but the valleys were filled with fog, ahove which the billtops stood like islands. At exactly ten minutes hefore sunrise (due at 7:26 A. M.), on looking northwest I saw a hrilliant arch of prismatic colors spanning the East Rock range, the highest point of which is 350 ft. above the sea. As the sun arose the arch diminished in hight and vividness, and hy the time the orh was visihle in tbe morning sky, the fog-bow had vanished."

Wet and Dry Thunderstorms.—A correspondent of the London *Times*, writing from tbe Transvaal, South Africa, says: "Every afternoon tremendous storms of thunder and lightning hurst upon us. These were of two kinds, the wet and the dry. The first is harmless, though noisy; the second exceedingly dangerous. During the dry thunderstorms, which were prevalent toward the end of October, the lightning seemed quite stupefying. It was unaccompanied hy either wind or rain. The angry flashee were followed almost simultaneously by awful crashes of thunder, which esemad to shake the earth. One or two tents were struck, and the grass was set fire to in several places within sight of our camps, hut no life was lost, only some arms damaged. The dry thunderstorms were soon followed by wet ones. The rain, mixed up with enormous hailstones, soused the thirsty earth, and every ltttle crack on the veldt hore its hurden of water to the Vaal, which rose and hecame impassahle."

A series of expariments are in progress at Portsmouth, England, in order to determine the dynamo-electric machino for the working of "search" lights on board of war vessels.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Feb. 2.		Week Ending Feb. 9.		Week Ending Feb. 16.		Week Ending Feb. 23.	
Alpha	2	1.80	2.15	1.80	2.10	1.80	1⅞	1.40
Alta	5½	....	5½	5	4.40	3	3.95	3.10
Andes	90c	75c	70c	65c	65c	50c	50c	45c
Albion	2.45	1.65	2¼	2.10	2¼	1.90	1.95	1⅝
Argenta	....	....	....	....	....	....	....	....
Addenda	....	....	....	....	....	....	....	....
Belcher	1.40	1.15	1.10	....	1.05	55c	70c	40c
Belmont	63c	70c	70c	....	70c	....	....	....
Best & Belcher	7⅜	7⅜	7⅜	7⅛	7⅛	6⅜	6¾	6¼
Bullion	1	90c	95c	85c	82c	45c	75c	60c
Bechtel	....	....	35c	....	....	....	40c	....
Belle Isle	....	....	....	....	....	....	....	....
Bodie	3.80	3.20	3.55	3.35	3.40	3	3½	2.95
Benton	95c	85c	1.05	95c	75c	65c	85c	70c
Bulwer	2.60	2½	2½	....	....	....	2½	2.40
Boston	....	....	....	....	....	....	....	....
Black Hawk	5c	....	....	....	....	....	....	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	30c	25c	25c	15c	20c	15c	10c	....
California	30c	25c	25c	20c	20c	10c	35c	10c
Challenge	....	....	40c	....	40c	....	50c	....
Chollar	1⅛	1.20	1⅛	1.10	1.35	1.05	1.20	1.05
Confidence	2½	2.10	2	....	1⅛	....	1⅛	1.10
Con Imperial	5c	....	15c	2c	10c	....	10c	....
Con Virginia	1.10	80c	75c	70c	70c	50c	65c	45c
Crown Point	1	75c	75c	70c	75c	55c	65c	40c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	55c	50c	....	....	....	....	....	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	15c	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	1	75c	85c	80c	85c	80c	85c	....
E. Mt. Diablo	50c	40c	45c	40c	45c	35c	40c	30c
Eureka Con	....	....	12	11½	12½	11⅜	13	12½
Exchequer	75c	70c	75c	65c	75c	55c	70c	45c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	2¼	2	2¼	2	2	1.90	2	....
Goodahaw	60c	50c	40c	35c	50c	30c	50c	40c
Gould & Curry	4	3.95	3.80	3.30	3.40	2.90	3.45	3.15
Hale & Norcross	2½	2.35	2.45	2.15	2¼	1	1.70	1⅜
Head Center	80c	75c	70c	40c	15c	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	10c	....	5c	....	5c	....	25c	....
Justice	1	90c	1.10	95c	95c	75c	90c	70c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	....	80c	....	80c	....	....	....
Kosouth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	15c	....	....	....	....	....	15c	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	1⅛	....
Martin White	3	2.95	3⅛	3.20	4.60	4.10	4.45	4.05
McClinton	....	....	....	....	10c	....	5c	....
Mono	1.45	1.05	1½	1	1	....	95c	1
Mexican	10⅛	9⅛	10⅛	9⅛	10⅛	8⅛	9⅜	8⅛
Mt. Diablo	8	7⅞	7⅞	....	7⅛	6½	7⅛	6¼
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	30c	5c	25c	20c	30c	20c	....	....
New York	....	....	....	....	....	....	....	....
Northern Belle	10⅛	9⅛	11	10⅛	11	9⅛	10⅛	9⅛
North Noonday	30c	....	10c	....	....	....	....	....
Navajo	65c	....	60c	55c	6.0	40c	....	....
Occidental	....	....	90c	....	....	....	60c	....
Ophir	6½	6	5⅞	5⅛	5¼	4¼	4.80	4.10
Original Keystone	....	....	....	....	....	....	....	....
Overman	1.10	95c	1⅛	75c	1.10	65c	80c	55c
Oro	15c	10c	3Cc	....	10c	30c	25c	20c
Paris	1	....	....	....	....	....	....	....
Potosi	1.70	1⅛	1¼	1.40	1.30	1.05	1.20	1⅛
Queen Bee	....	....	5c	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.70	1.60	2.10	1⅛	1.65	1¼	1.65	1.35
Seg Belcher	4.90	4⅛	5.55	5¼	4.05	3	....	....
Sierra Nevada	9¼	8	9¼	6¼	8¼	7	7⅛	6¼
Silver Hill	20c	....	10c	....	....	....	5c	....
Silver King	....	....	19	18¾	19	18¼	18¾	18⅜
Snecor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	1.05	95c	95c	90c	90c	70c	75c	65c
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	10c	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	25c	....	25c	....	25c	15c	....	....
Tioga Con	15c	10c	....	....	25c	20c	20c	10c
Tiptop	4⅛	4.20	....	....	....	....	4¼	4.10
Tuscarora	....	....	....	....	....	....	....	....
Union Con	11⅛	11	11⅛	10⅛	11⅛	9⅞	10⅜	10⅛
Utah	5⅜	5⅛	5⅜	5	5⅜	4.95	5⅛	5⅜
Wabash	....	....	....	....	3.70	3¼	....	....
Wales	75c	....	....	90c	85c	70c	55c	60c
Yellow Jacket	3	2.65	2.55	2.15	2.05	1⅛	1.85	1

Sales at S. F. Stock Exchange.

Thursday A.M., Feb. 23.

30 Alpha 1¼
575 Alta ..... 3.60@3.55
300 Andes ..... 50@45c
405 Belcher 50c
50 B & Belcher 63
200 Bullion 75c
200 Benton 75c
275 California ..... 25@30c
170 Con Virginia ..... 45@50c
20 Chollar 1.10
120 Confidence 1.15
130 Crown Point ..... 45@50c
4900 Con Imperial 10c
300 Caledonia 10c
750 Exchequer ..... 50@45c
220 Gould & Curry 3.15
400 Hale & Nor 1⅛
1100 Justice 80c
80 Mexican 9⅛
275 Ophir ..... 4.20@4.15
540 Overman ..... 55@60c
150 Potosi 1.05
430 Savage ..... 1.40@1.45
190 Sierra Nevada 6⅞
30 Scorpion 70c
30 Silver Hill 5c
555 Union ..... 10⅛@10⅜
695 Yellow Jacket 1.05

Bullion Shipments.

We qnote shipments since our last, and shall hs pleased to receive fnrther reports:

Noonday, Feh. 14th, $5,760; North Noonday, 14th, $6,216; Star, 13th, $1,561; Contention Con., 16th, $15,260; Standard, 13th, $11,434; Northern Belle, 13th, $7,964; Mt. Diahlo, 14th, $8,800; Enreka Con., 10th to 13th, $9,003; Mt. Diahlo, 18th, $8,528; Northern Belle, 16th, $6,162; Bodie, 19th, $7,665; Christy, 17th, $1,963; Silver King, 11th, $19,238; Star, 17th, $1,195; Enreka Con., 14th and 15th, $4,104; Lyon, 17th, $13,691; Horn Silver, 14th, $25,000; Stormont, 15th, $6 950; Germania, $10,500; Hananer, 18th, $2,750; Tintic, 16th, $3,681; Barhee & Walker, 16th, $1,385; Horn Silver, $35,000; Germania, $3,900; Hananer, $2,700; Germania, 19th, $7,850; Hananer, 19th, $2,350; Stormont, 19th, $3,750.

WATER RIGHT DECISION.—The Snpreme Court of California, in a case taken from San Joaquin connty, has declared that the following instrnction, given hy the court helow, was proper: Every riparian owner npon a stream has a right to use, in a reasonahle way, the water of said stream for domestic purposes, for the irrigation of his land, or for propelling machinery, if the qnantity of watsr will warrant snch nse, ahove the amount reqnired for domestic purposes.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	15	50	Jan 6	Feb 9	Mar 2	W Willis 309 Montgomery st
Andes S M Co	Nevada	16	25	Feb 2	Mar 9	Mar 30	B Burris 309 Montgomery st
Belcher S M Co	Nevada	29	50	Feb 6	Mar 11	Mar 31	J Crockett 327 Pine st
Belvidere M Co	California	13	25	Feb 9	Mar 14	Apr 3	C V D Hubhard 310 Pine st
Best & Belcher M Co	Nevada	22	50	Jan 4	Feb 7	Feb 28	Wm Willis 309 Montgomery st
Bullion M Co	Nevada	23	30	Jan 19	Feb 21	Mar 14	J M Brazell 328 Montgomery st
California M Co	Nevada	2	20	Jan 18	Feb 25	Mar 22	C P Gordon 309 Montgomery st
Champion M Co	California	10	25	Jan 12	Feb 20	Mar 13	B Burris 309 Montgomery st
Chollar M Co	Nevada	7	25	Jan 9	Feb 14	Mar 7	W E Dean 309 Montgomery st
Con Imperial M Co	Nevada	17	10	Jan 4	Feb 8	Mar 1	W E Dean 309 Montgomery st
Con Pacific M Co	California	4	25	Jan 23	Feb 28	Mar 27	F E Lutz 330 Pine st
Con Virginia M Co	Nevada	17	30	Jan 31	Mar 11	Apr 8	A W Havens 309 Montgomery st
Crown Point G & S M Co	Nevada	47	25	Feh 16	Mar 28	Apr 13	J Newlands 327 Pine st
Day S M Co	Nevada	10	50	Jan 28	Mar 6	Apr 3	E M Hall 327 Pine st
Equitable T & M Co	Utah	26	10	Feh 2	Mar 9	Mar 29	C J Collins 512 Montgomery st
Exchequer M Co	Nevada	18	25	Jan 12	Feh 15	Mar 6	C E Elliot 327 Pine st
Gould & Curry S M Co	Nevada	41	50	Jan 12	Feh 16	Mar 9	A K Durhrow 309 Montgomery st
Julia Con M Co	Nevada	17	20	Jan 17	Feh 24	Mar 16	H A Charles 419 California st
Mariposa Land & M Co	California	22	25	Dec 23	Jan 31	Feh 28	L Leavitt 309 Montgomery st
Martin White M Co	Nevada	11	25	Jan 20	Mar 2	Mar 30	J J Scoville 309 Montgomery st
McMillen M Co	Arizona	4	30	Feh 8	Mar 14	Apr 12	J Morizio 328 Montgomery st
Modoc Con M Co	California	10	30	Feh 14	Mar 28	Apr 25	J W Pew 310 Pine st
Mono G M Co	California	16	30	Feh 7	Mar 14	Apr 3	W H Lent 309 Montgomery st
Napoleon M Co	California	1	03	Jan 13	Feh 13	Mar 2	H Smith 309 Montgomery st
New York M Co	Nevada	27	15	Jan 18	Mar 7	Mar 28	F E Dietz 327 Pine st
Noonday M Co	California	5	25	Dec 30	Feh 8	Mar 2	W J Taylor 310 Pine st
North Noonday M Co	California	5	25	Dec 30	Feh 10	Mar 3	W J Taylor 310Pine st
Overman S M Co	Nevada	52	50	Jan 9	Feh 14	Mar 7	Geo Edwards 414 California st
Pinal Con M Co	Arizona	2	30	Jan 24	Mar 7	Apr 3	W W Traylor 309 Montgomery st
Rex Montis M Co	California	14	25	Jan 9	Feh 14	Mar 10	J W Ward 426 California st
San Jose M Co	Nevada	18	75	Jan 30	Mar 15	Apr 19	A Carrigan 109 Front st
Savage M Co	Nevada	49	50	Jan 6	Feh 8	Feh 28	E B Holmes 309 Montgomery st
Seg Belcher M Co	Nevada	21	1 00	Feh 14	Mar 20	Apr 18	C D Edwards 414 California st
Silver Hill M Co	Nevada	17	15	Feh 2	Mar 9	Mar 29	W E Dean 309 Montgomery st
Spaulding G & S M Co	California	2	10	June 23	Feh 23	Mar 24	J W Pew 310 Pine st
Tioga Con M Co	California	15	10	Jan 12	Feh 16	Mar 8	W H Lent 309 Montgomery st
Tombstone Con G & S M Co	Arizona	1	02	Jan 9	Feh 13	Mar 6	J M Buffington 309 California st
Utah S M Co	Nevada	37	1 00	Jan 14	Feh 17	Mar 7	G C Pratt 309 Montgomery st
Yellow Jacket S M Co	Nevada	44	1 00	Feh 7	Mar 4	Apr 11	M Otey 327 Pine st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Bay State S M Co	Nevada	1	02	Dec 29	Mar 1	Mar 27	J W Pew 310 Pine st
Bed Rock M Co	Arizona	1	05	Feh 9	Mar 13	Apr 3	O H Graves 6 Post st
Blue Bell Con M Co	Nevada	2	50	Jan 19	Feh 24	Mar 17	H P Bush 431 California st
Butte Creek Hydraulic M Co	California	8	10	Dec 29	Feh 15	Mar 6	A L Taylor 230 Montgomery st
Excelsior Deep Grav M Co	California	17	25	Jan 10	Feh 14	Mar 7	D B Chisholm 327 Pine st
Excelsior W & M Co	California	3	1 00	Jan 9	Feh 10	Mar 2	L O McAfee 326 Montgomery st
Golden Fleece Grav M Co	California	24	30 00	Jan 31	Mar 4	Mar 23	F Schirmier 785 Folsom st
Gopher Con M Co	Nevada	2	50	Jan 9	Feh 20	Mar 20	H Dean 309 Montgomery st
Little Chief M Co	California	1	5 00	Jan 13	Feh 17	Mar 11	S C Dean 22 California st
Maybelle Con M Co	California	10	20	Dec 31	Feh 7	Mar 1	W J Taylor 310 Pine st
Mayflower Grav M Co	California	14	10	Dec 30	Feh 3	Feh 28	J Morizio 323 Montgomery st
Oro M Co	California	11	15	Jan 7	Feh 13	Mar 7	W Stuart 320 Sansome st
Pinal Copper Co	Arizona	3	2 50	Jan 23	Feh 6	Mar 27	Geo T Shaw 640 Fourth st
Shoody G M Co	California	3	04	Dec 31	Feh 4	Feh 25	R D Hopkins 436 Montgomery st
Rocky Point M Co	California	10	05	Jan 13	Feh 13	Mar 6	D M Kent 330 Pine st
Sigourney G & S M Co	California	3	03	Jan 24	Feh 28	Mar 20	A Judson 320 Sansome st
South Hite G M Co	California	3	10	Jan 9	Feh 16	Mar 7	F A Berlin 420 Montgomery st
Vanderhilt M & M Co	Nevada	3	05	Jan 16	Feh 24	Mar 16	J Morizio 328 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alexander M Co	——	A B Cooper	328 Montgomery st	Annual	Feb 25
Arzona G & S M Co	Utah	N C Carroll	320 Sansone st	Annual	Feh24
Cataract & Cde West Gr M Co	Cal	W B Lake	240 Montgomery st	Special	Feh 28
Concordia M Co	——	W J Taylor	310 Pine st	Annual	Mar 6
Golden Chariot M Co	Idaho	J T McGeoghegan	318 Pine st	Annual	Mar 6
Hale & Norcross S M Co	Nevada	J F Lightner	309 Montgomery st	Annual	Mar 8
Maryland Con M Co	——	E P Farnsworth	219 Sansome st	Annual	Mar 6

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Feh 13
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Feh 15
Silver King M Co	Arizona	J Nash	315 California st	25	Feh 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Feh 13
Standard Con M Co	California	Wm Willis	309 Montgomery st	75 (extra)	Jan 12
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10	Jan 3
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10 (extra)	Jan 3

Mining Share Market.

"Not mnch doing in stocks" has got to he snch a common expression that people are tired of hearing it. Yet we mnst repeat it this week. The shntting down of work at the Forman shaft in the Comstock is the most notahle event affecting stocks, thongh it is hoped that this snspension of operations at that point will he of short dnration.

The sump of the hig C. & C. winze, on the California and Consolidated Virginia line, has been completed, and a station is now being cut ont in it at the 2700 level. When this station is completed a drift will he startsd north to connect with that going sonth from the Ophir on the same level.

The Overman folks will continne their prospecting operations on their 2275 level, and it is to he hoped that they may make a strike that will cause the other companies to resnme work in earnest at an early day.

At the sonth end a drift is heing rnn into Jnstice ground on the 2150 lsvel of Alta, and also from the same point northward into the Benton gronnd. Work will also soon he resnmed in the face of the east drift, 2150 level.

Down at Bodie, according to the *Free Press*, mining operations during the past week have progressed mnch the same, with a decided tendency to improve. On the 100 level of the Standard indications are more than favorable; indeed on the street rnmors prevailed that a very favorable hody of ore had hsen strnck at that point, hnt these rumors conld he traced to no reliahle sonrcs. The feeling, however, of the camp is that we are on the eve of some very favorahle developments. They continne crosscntting on the 1,000 level of the Standard and the resnlt of this work will be awaitsd with interest. On the 25th instant crosscntting will he commenced on the 750 level of the Oro, and great confidence is felt that this work will nncover something valnable. On the 800 level of the Lent shaft crosscntting is in progress. In this work, also, much interest is felt. Work is progressing favorably in the Tioga Con., and, in fact, all the mines from which there hasheen reason to expsct anything, seem to he doing decidedly favorahle work.

THE Truckee *Republican* says the pressnt season has heen the most favorahle for logging for many years. An immense amount has heen cnt, and qnite an army of men and teams have heen employed on the Little Truckee.

Hot Water in Mines.

In some of the mining regions of this coast the greatest difficnlty with which the camps have to contend is lack of water. In some places the mills have to he placsd many miles from the mines, and considerahle expense entailed in hanling ore, owing to lack of water at the mines themselves.

At other places, again, just the opposite difficulty is met with. The mines are so wet that all the profits are swamped in the efforts to free them of water. Probahly at no other place has this heen so apparent as on the Comstock. The amount of water that has to he raised is enormons, almost heyond the conception of those not familiar with snch matters. Heavy and expensive pnmping machinery, with all the ingenions adjnncts, improvements and appliances for effectiveness and economy which can he devised, are in nse on these mines. In addition, one of the longest tunnels in the world has been rnn at very heavy cost to tap the mines.

Water at ordinary temperatnre is had enongh, hnt when it is met with so hot as to scald anyone tonching it, the difficnlties are greatly enhanced. An illnstration of this is shown in making the recent Savage connection. The upraise was started a little south of the month of the incline so as not to interfere with the drill-hole that was draining the watsr. In this way the hot water was avoided and tolerable good progress made. When near the point of connection the hole had to he tnrned, of course, to meet the incline. The scalding hot water was then encountered and from that time it has been necessary for the workmen to stretch a canvas overhead to catch the dropping water before a hole is started. This consnmes time. When the holes are charged it is necessary to fire them at once to keep the water from washing the explosives ont, and the canvas covering is hlown ont along with the rock. Before work can be resnmed the same steps have to he taken so that ahont 24 honrs elapse hetween the firing of charges. It is mining under difficnlties.

A GENTLEMAN from Sutro says times are very dnll there. A nnmher of families are moving away. Others only remain in hopes that at the annual meeting of the Tunnel Co., which occnrs March 6th, orders will he issned to drive the tunnel throngh Mt. Davidson. Shonld this not he done, two-thirds of the inhahitants of the place intend leaving.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

BUTTE.

NOTES.—Orovillc *Mercury*, Feh. 17: Messrs. Brock & Taher are now the owners of the celehrated Banner mine, together with the mill and hoisting works, they having purchased it from Burke & Kenney. The property is estimated to he worth $50,000, and is probahly one of the richest quartz mines in this county.

BIG BEND.—The Big Bend Tunnel M. Co. is being pnshed forward at a rapid rate. The company was formed in Buffalo, New York, and the following officers were elected: Ray V. Pierce, President; Geo. H. Van Vleck, Vice President; James H. DeGraf, Tressurer; Jas. A. Roherts, Secretary; N. A. Harris, of this city, Resident Agent. Major McLaughlin and Col. Logan left for Europe on the 14th day of this month for the purpose of getting foreign capital to invest. For this purpose they will visit London and Paris. The company voted them $20,000 to defray their expenses on the trip. Waldemar Allstrom has sold out and now has no interest in the company. Mr. Ed Harkness is the accountant in this city.

TREASURE BOX.—The Treasure Box mine, situated just across the river, is working night and day, running their tunnel into Table mountain. They are now in at the present time about 2,200 ft. This distance brings them under the bench which lies next to the mountain, and they are therefore not under the main mountaio. The face of the tunnel is in pipe clay and gravel. The gravel is spotted, sometimes prospecting rich and at others very low.

CALAVERAS.

SHAFT.—*Mountain Echo*, Feh. 14: David Findley & Co. are at present sinking a shaft on the Doc. Hill mine. The veiu is about 5 ft in width, and the ore prospects well. They have now on hand over 20 tons of quartz that has the appearance of being rich.

WORKING ORDER.—We paid a visit to T. L. Lindsay & Co.'s mine the other day and found everything in working order. The main shaft, in which work is being done, is 7x3½ ft in the clear, is about 45 ft deep, and is one of the best timhered shafts in the country. This mine is situated one mile west of Angels, and was known in former years as the Antone claim; it has heen owned, however, by the present proprictors for a number of years, and has yielded them an immense revenue. If energy and perseverance is of any importance, the present company will succeed.

OSBORN.—We called upon the proprietors of the Osborn mine the othcr day at Smith's flat, and found one of them busily at work. He showed us some fine specimens of rock which he had taken out that day. The mine is looking well.

THE owners of the Black Oak mine have finally completed their preparations, and are now ready for more extensive operations. This mine, as before stated, is situated about 3 miles northwest of Angels, and owned hy Osborn & Fisher. It is, perhaps, one of the richest mines in this section.

RASPBERRY MINE.—Work is still going on this mine, hut, as there has heen no clean-up made recently, nothing of importance can be said of it. Work on the Bovce mine still continues.

MCELROY MINE.—Supt. Eudy, of the McElroy gravel mine, is working away, making preparations to work the mine properly.

EL DORADO.

NEW MILL.—Amador *Ledger*, Feh 17: Knight & Co. have just shipped all of the machinery for the 10-stamp mill to he put up near Placerville, El Dorado county. The hauling was done hy teams from El Dorado, and required 5 or 6 heavily loaded teams. The same firm has also sent out recently a water wheel for the Church Union mine, in El Dorado county. H. G. Murray has goue there to put the machinery in position.

STAMPS AFTER ALL.—Georgetown *Gazette*, Feh. 17: The Eureka has shut down. This sounds like had uews. Indced it does. But hold! You want to know why it has shut down, and whether it is only temporary. The *Gazette* has frequcntly told its readers that the Eureka was a good mine, comprising an immense hody of ore from 12 to 20 ft in width, and would yield upon an average of about $6 per ton in free gold, not counting the sulphurets, which will yield enough more to swell the yield of the ore to at least $12 per ton. The mine has shut down simply hecause the new mill wore itself out after grinding about 100 tons of ore. The new candidate for trial did admirably good work on the first 50 tons, and both Mr. Baird and the operator, Mr. Powning, were pleased with the working and the good resulta obtained. But Mr. Baird now joins in the opinion entertained by the most eminent and practical quartz mon of California, that the common stamp mill is the boss, and, accordingly, the Eureka will he supplied with a good stamp mill at an early day. How many batteries will he put up at first wo have no authority for stating; hut we helieve that not less than 40 stamps will enliven that end of town before the end of the approaching summer. Mr. Baird makes no hlow of what his company is going to do. What he says is emphatic, and, we helieve, reliahle.

DEL NORTE.

HAPPY CAMP NOTES.—Del Norte *Record*, Feh. 11: The winter thus far has proved very unfavorahle for the mining population with few excep.ions, and as the prosperity of Happy Camp depends upon the amount of gold-dust extracted from the hanks—gravel hanks 1 mean, not savings hanks—why, all that is essential is plenty of water and systematic application. The miners commenced to work on the 27th day of December, and continued their vocation until the 4th or 6th inst., with but few exceptions; for want of the one thing needful—water—ceasing operations. Since the 6th till the prescut time the weather has heen delightful; frosty mornings and a clear, bright sky, dotted here and there with a whitn cloud in keeping with this time of year.

INYO.

PANAMINT.—*Independent*, Fch. 18: With the halance of the hullion from the month's run of the hig mill at Panamint, amounting in all to ahout $24,000, Supt. Phehy has gone to San Francisco. The company is still working the Wyoming mine and has lessed several others to chloriders, who are getting out rich ore for another run.

THE JEANNETTE.—Harry Wright and Henry Malone have heen working an old gold ledge near Fish Springs, and are elated over the developments.

MARIPOSA.

COULTERVILLE ITEMS.—Cor. Mariposa *Gazette*, Feh. 18: I am informed by a reliable gentleman, who has the means of knowing, that the mode of working the Black hill ore has proved a success; which is to he followed up hy a test on hard ore taken from the Champion mine, owned by Mentzer & Co. If the same method results as favorably in hard quartz as it does in talc, it will completely revolutionize the present mode of milling quartz rock:

NEVADA.

LEAD ORES.—Grass Valley *Union*, Feh. 16: Wm. Gay, who is interested in a miuing location called the Mammoth, which is about one mile northwest of Spenceville, brought to town yesterday a number of pieces of ore from the claim which were remarkably heavy in lead. This was taken out within 4 ft of the surface of the ground. There were no assayers or experts here to prove whether the ore contained silver, hut appearances favored the helief of the presence of that valuahle metal. The great copper helt runs through the foothills at Spenceville and vicinity, and these lead ores are in the same geological formation. Some of the veins prospect in gold,

but are not rich in that precious metal. The region to the north and south of Spenceville is rich in copper ores, and lead and silver may yet be found in quantity to prove profitable for working, as the specimens seem to indicate.

WASHINGTON MINE.—Grass Valley *Tidings*, Feb. 18: Work at the Washington mine has been stopped for a week or so, partly on account of a scarcity of water, and partly for repairs and improvements on the big wheel. A new wheel is being made, with other castings, in San Francisco, and will be shipped here as soon as they are completed. The large water wheel will be so arranged and improved upon as to give more power and better satisfaction. As soon as the roads become good, so that wood may be hauled, active work will be resumed.

FORD AND MULLEN MINE.—We were to day shown 8 candle boxes filled with specimen rock which came from the Ford and Mullen mine. The rock glitters with gold. Two boxes of it, which were taken out last evening and deposited in J. F. Judd's vault, are valued at $1,950. Thirty lbs of specimen rock was recently sold by the company to San Francisco parties for $1,910 25. The mine is looking as well as ever, and every few days a box of valuable specimen ore comes out. It was pay day for employees of the company to-day, when all hands were paid off at the store of James F. Judd, in Boston ravine.

PLACER.

RICH QUARTZ.—Placer *Times*, Feb. 18: Tuesday we were shown some quartz specimens by Capt. Anderson that were very rich with free gold. They came from a ledge on Rock creek, about 2 miles this side of Auburn station, which Anderson and two other men located last October. The main vein can be traced several hundred ft by the croppings on the surface, and, so far as examined, the rock, mainly, is very rich. The specimens shown us, it is judged, would go about $1,000 to the ton. A lot of 52 lbs of the rock, not so rich as the specimens we saw, were pounded up in a mortar and $28 was the amount cleaned up. The shaft is down 15 ft and the rock all contains gold visible to the naked eye. Capt. Anderson has been hunting for a strike like this for a long time, and we are glad he has at last found so rich a prospect. The ledge will be worked in the spring extensively.

PLUMAS.

ROUND VALLEY.—Greenville *Bulletin*, Feb. 15: W. E. Adams states that he crushed 400 pounds of rock from the ledge lately found by him at Round Valley, and got about $7.50. The rock was crushed in a hand mortar under very disadvantageous circumstances.

PROPERTY SOLD.—The personal property of the Plumas National mine was sold at auction on Saturday, at the mine. The real estate was sold at the Court house in Quincy, on Monday. No report has been received of the prices obtained. It is said that the affairs of the company will now be settled up and the mine and mill put in operation again as soon as spring opens.

SIERRA.

EXTENSION.—Sierra County *Tribune*, Feb. 17: The Bald Mountain Extension Co. cleaned up 87 ounces of gold last Sunday as a result of one week's washing. The air shaft of the Bald Mountain mine filled up last Saturday, thereby necessitating suspension of work until Monday afternoon.

SIERRA CITY.—Our town has been lively since pay day of the Marguerite and Sierra Buttes quartz mines, the former having paid on the 7th inst., and the latter on the 5th inst. Our mining interests are assuming a favorable outlook for the future, and great preparations are being made for spring work. The Marguerite Co. is taking out the richest ore of any mine in this section. It is immensely rich. The Haskell Peak Oravel Co. is running in cement and quartz gravel. At the Blue Oravel mine they are raising an air shaft and running the main tunnel ahead. Work is progressing steadily at the 1001 gravel mine. The hydraulic gravel mining companies are not working along the river on account of the cold weather.

GOOD HOPE.—*Mountain Messenger*, Feb. 18: Mr. Cunningham, Secretary of the company that owns the Good Hope quartz mine, was up this week and satisfied all the liens that had been filed against the property. The whole sum was only some $2,200. It is said that the mill will be started as soon as the weather will permit. The company has about 100 tons of rock in the dump house, but will not be able to get down any more until the weather is more favorable.

GOOD HOPE EX.—Wm. Messerve is running a tunnel on the Good Hope Extension, and expects to strike the ledge at a depth of 100 ft in a week or two. There is very good rock on the croppings of this ledge, which lies next north of the Good Hope.

TUOLUMNE.

SULPHURETS.—Tuolumne *Independent*, Feb. 18: It does not pay to ship sulphurets or concentrations that will go less than $30 per ton; although it will pay miners to save them, however low the grade may be, for in the "high future" furnaces will be erected in this county that will work almost anything with a profit in that line; and the storage of such material costs nothing, until such time arrives.

GRAVEL.—Freels & Co. have leased Mr. Kelley's lot, opposite Sonora foundry, for mining purposes, where they have struck a rich gravel bed—having demonstrated the fact by a shaft. They will now proceed to tap the diggings by a tunnel under the road for the purpose of hydraulic mining, if necessary. Only a portion of the rich spots in and around Sonora have been discovered.

NEVADA.

WASHOE DISTRICT.

CALIFORNIA.—*Enterprise*, Feb. 16: On the 1050 and 1750 levels are clearing out and repairing the drifts and winzes connecting with the old Con. Virginia shaft.

CON. VIRGINIA.—On the 1050 and 1750 levels are cleaning out and repairing drifts and winzes connecting with the old Con. Virginia shaft.

SIERRA NEVADA.—On the 2700 level the main north lateral drift has been extended 14 ft, and the joint Union Con. east winze has been sunk and timbered 6 ft.

ALTA.—Since last report the north lateral drift on the 2150 level was extended 31 ft, and the lateral drift south 31 ft. The west drift was extended 40 ft; total length, 837 ft. The drain drift on the 1250 level is completed, and the water in the lower levels of the Justice is draining off. Rock hoisted, 526 cars; wood consumed, 80 cords; strokes made by pump, 37,000.

YELLOW JACKET.—No work has been done in the mine since the morning of the 12th instant, at which time a large flow of water came to our shaft from the Imperial group of mines, and which has since continued, filling our 3000 and 2328 levels, and this morning the water stands 5 ft deep on our 2700 level station. We are pumping and bailing an average of 102 miners' inches per 24 hours. When the water reaches the 2560 level of the Belcher and Crown Point mines, their pumps will assist in handling the same. The water is said to come from a quartz body cut in the Exchequer mine, 2800 level, our 2700 level, and which will no doubt require 30 days or more to drain.

OPHIR.—On the 2700 level the main south drift has been extended 30 ft. On the 1700 level are repairing joint California east crosscut.

UNION CON.—On the 2700 level the main north lateral drift has been extended 26 ft and the main south lateral drift 36 ft.

BARBEE DISTRICT.

THE MINES.—Cor. *Silver State*, Feb. 10: Barbee district is situated on the eastern slope of the Humboldt range, 4 miles from Humboldt House, on the C. P. R. R. Prominent among the mines of the district, which have been prospected to any extent, is the Silver Belle, which is being opened by an incline shaft that has reached a depth of 85 ft. This is a free milling ore and can be worked by ordinary mill process to 90 per cent of its assay value. Next in importance is the Tecumseh, which is a very promising prospect. The vein is composed of white quartz, having well-defined walls. The ore carries 80 ounces of silver to the ton, and contains a small percentage of lead. The lead has an average thickness of 2 ft for 125 ft, the distance it has been uncovered on the surface. The Climax and Oro Plata are located on the same vein, and can be traced a distance of 2,000 ft. These properties all belong to Judge Barbee, who is now in Salt Lake, and, will, as soon as the weather settles, increase the working force and push the developments. Lively times may be looked for in the district the coming season.

BELMONT DISTRICT.

BELMONT.—*Courier*, Feb. 11: The draft to our furnaces was rather poor, so we concluded to shut down both furnaces so as to increase the size of the fires under the dry kiln. Also make some improvements on the furnaces, and wait the arrival of two new wheels which will arrive here on Saturday, the 11th inst. Also had some other little repairs to make on steam drum, etc.

BULLION DISTRICT.

LADY OF THE LAKE.—Eureka *Sentinel*, Feb. 10: The Lady of the Lake mine in Bullion district, Lander county, situated 23 miles from Beowawe and about 10 miles from S. Wenban's mine, in Cortez district, has been sold to Eureka parties, the purchasers being Messrs. W. O. Mills, Jr., James H. Mundy, John E. Plater, H. Muller, Wm Arrington and B. C. Levy; the sellers, Messrs. W. H. Du Commun and James Lovie. The price paid for one-half the mine is $8,000. The sellers surrender one-fourth of their remaining interest in consideration of their share of the profits of mining and milling on a one-fourth ownership. The company have leased (with the privilege of buying) a 5-stamp mill, 2 miles from the mine, from which ore is easily transported down the mountain. The mill is situated on a creek, which supplies ample water. Five men have been sent from Eureka to work the mine under Mr. DuCommun, who will act as foreman.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, Feb. 18: Thirteen feet have been added to the depth of the main shaft during the week; the total distance made to the 13th instant was 65 ft. Within a few days a very encouraging development has been made between the seventh and eighth levels. It is in the west part of the mine, and in new ground. Sufficient work has not yet been done to determine its extent. There is no change in other levels above the adit. Sixty-four tons of ore are being extracted daily and sent to the mill. Bullion shipments for the week ending February 17th, $14,120.45. Shipments on February account to February 16th, $30,470 88.

MOUNT DIABLO.—The east drift on the third level has advanced 16 ft and shows more favorable ground in the face. The stopes above this drift look encouraging and are yielding considerable ore of a very good grade. The stope from the north crescent on this level is looking well. The first level stope continues to turn out a very fair quantity of good ore. A shipment of bullion was made on the 10th instant amounting to $3,501.10, and another on the 14th amounting to $8,822.09.

EAST MOUNT DIABLO.—Arrangements have been made with the Mount Diablo M. and M. Co. for the use of its shaft to work their mine. The east drift on the third level of the last-named property has reached the line between the two mines. The company will now drive the drift into its ground, using the Mount Diablo shaft for hoisting purposes. This will prove the East Mount Diablo to a depth of 400 ft, and some interesting developments may be expected as this work progresses.

SOUTHERN NEVADA.—Work on this mine is progressing with a force of 7 men. During the week the main drift has been driven a distance of 18 ft through a body of rich chloride ore.

PRINCESS.—The guides have been put in the shaft and the cages placed in position, all preparatory to starting up with steam.

CORY DISTRICT.

BIG INJUN.—Esmeralda *Herald*, Feb. 17: The Big Injun mill in Cory district is running successfully. The company contemplate putting in five more stamps next spring.

CRABB DISTRICT.

EAGLE BIRD.—Esmeralda *Herald*, Feb. 17: The Eagle Bird mine is looking well. Mr. Crabb has about 30 tons of ore on the dump, with any amount of rich ore in sight. Lupton's mines, the Dixie and Captain Jack, are showing up well. Messrs. Hernleben, Erway & Horn shipped a four-horse load of ore from their mine in this district to a mill in Six Mile canyon, and had it worked in small lots for a test. One lot worked $700 to the ton.

ESMERALDA DISTRICT.

THE CORTEZ MINE.—*Herald*, Feb. 17: The development in this mine are more encouraging than ever. The ore dumps and chutes are increasing in bulk every day. They must soon get a mill or increase the capacity of their dumps. The southwest drift from the lower tunnel is now extended a distance of about 90 ft, and shows ore in full face which will mill at least $30 per ton, and is daily increasing in quality. Taking all together, the prospects of the mine were never more flattering.

THE UTAH.—Developments in this mine commenced yesterday morning under the management of T. H. Wells, he and L. Richardson having a bond of the same. A force of seven men were put to work on 8-hour shifts of 2 men each, with 1 car man. The work for the present will be prosecuted by extending the northeast drift in the lower level of the Cortez onward in the Utah, which will prospect the latter mine at a depth of 276 ft from the apex of the ledge.

HUMBOLDT M. M. Co.—The finishing touches are being put on the company's mill, and ex-Gov. Blasdel informs us that it will be in complete order for crushing ore on the 1st. There are between 300 and 400 tons of ore on the dump at the mine, with plenty more in sight.

THE CENTENNIAL is turning out the usual amount of rich ore and employing the usual number of men.

LAKE DISTRICT.

LARGE LEDGES.—Esmeralda *Herald*, Feb. 17: There are a number of large ledges in this district which will be prospected next spring. Most of the ore is heavy with lead, and in places is found in quantities near the surface, sometimes very rich in silver.

THE OHIO.—The shaft of the Ohio is now down 60 ft, and shows a vein of pay ore about 12 inches in width in a ledge of about 5 ft. The whole ledge will give good assays. Work, which was suspended a short time ago, will soon be resumed. The owners expect to ship considerable ore next summer.

LIDA VALLEY DISTRICT.

PROSPECTS.—Lyon Co. *Times*, Feb. 18: The Centennial Sapphire Mining Co. has had the claims belonging to it surveyed preparatory to procuring patents. A contract has been let for a shaft to be sunk from the 70 level. The mine is reported as looking well, and it is expected that a mill will be in operation inside of a year. Supt. A. C. Hamilton intends to push operations, and will doubtless soon make the mine justify the reputation it formerly held, of being one of the valuable mines of Nevada. The 5-stamp mill 2½ miles south of Lida has been purchased by Wm. Appleby and ex-Assemblyman Tom Lane, of Storey county. They own several good mines in the neighborhood, and intend working their own ore in addition to doing custom work. They are experienced mill men and will doubtless by the successful working of their mill add much to the prosperity of the camp.

GOLD MOUNTAIN DISTRICT.

STATE LINE.—Esmeralda *Herald*, Feb. 17: The State Line mill at Gold Mountain has been running twenty stamps for the past two weeks. There are 20 men at work in the mine and mill. The mill machinery is of good pattern, nearly all entirely new. No clean-up has yet been made, and the result is therefore not known, but at present everything promises a profitable working.

SANTA FE DISTRICT.

COPPER.—Lyon Co. *Times*, Feb. 18: The Stone Cabin copper mines, in Santa Fe district, which were bonded a short time ago by R. R. Thurman, sent a lot of ore to the Lyon mill and mining company which went over 30 per cent. in copper. A company is incorporating in New York to work these mines, and there is every prospect that they will prove a good investment. There are now 200 sacks of ore, ranging from 30 to 40 per cent. in copper, ready for shipment.

TUSCARORA DISTRICT.

TO BE RE-OPENED.—*Sentinel*, Feb. 18: From a gentleman in Eureka, who has come here from Tuscarora in the last few days, we learn that negotiations are on foot to re-open the Grand Prize and Argenta mines. Those to whom the Grand Prize Co. is in debt to allow them to resume operations and wait for payment out of the proceeds of the working. This will be good news for that camp, and if the arrangement is effected it will give it new life. Some of the mines over there show good prospects, and it is cheering to know that they may be yet worked for all they are worth. The water in the Grand Prize, since the abandonment of the hoisting works, has not risen above the 500 level. The labor of cleaning out this mine, which the Argenta joins, the latter being worked through the former on this account, will not be near so great as has been apprehended.

ARIZONA.

WATER AT DOS CABAZAS.—*Gold Note*, Feb. 11: The only objection that has heretofore been made to our mines, was that the water supply was so limited as to render it impossible to work them with profit. About a year ago a company of capitalists was formed at Denver, Colorado, their object being to develop several of the larger prospects along the immense gold ledge a mile or so north of Dos Cabazas. After a visit to this place, however, they decided at a meeting of the company, that "it would not be profitable to carry their plans into execution, owing to the apparent fact that a sufficient water supply could not be found near the mines for milling purposes." For this reason was a scheme abandoned that subsequent developments prove would have enriched the company. Many owners have relinquished designs of opening up and developing our mines because they deemed the water supply insufficient. Very few fortunes have been made without a considerable money outlay at the start, and experience has shown that it is not always safe to trust surface indications. If either of the companies that have visited this camp for the purpose of investment, had sunk a shaft in any of the properties, they would have discovered that water exists at a depth of 75 or 80 ft in inexhaustible quantities. When the Commonwealth Co. reached a depth of 120 ft on the Bear Cave mine, water flowed at the rate of 10,000 gallons per hour, and there is now standing in that mine at least 40 ft of water. Now that the water question has been definitely settled, it is hoped that parties in future will not permit opportunities which this camp offers to slip by them. At an expense of a few thousand dollars our mines can be opened so as to reveal to those engaged in the work millions of wealth.

SOMETHING NEW.—Dos Cabazas *Gold Note*, Feb. 11: An acquaintance just in from Wood Camp, informs us that while there he examined two valuable discoveries recently made in the eastern part of that district, named the H. Ordway and Nelson Hunt. The former is composed of a series of small veins of quartz, varying from 2 to 8 inches wide, lying but short distances from each other, and carrying an abundance of free gold—no silver. The latter is a vein of red silver ore about 18 inches wide, of high grade. Nothing of the kind has ever before been discovered in that part of the district; all of the ores heretofore found being free gold, galena and carbonate of lead and copper.

WINCHESTER DISTRICT.—*Gold Note*, Feb. 11: Dr. Stamhurn & C. A. Bartholamew, owners of the extensions north and south of the rich strike in Winchester district, were in town Wednesday, bringing in very rich samples of ore from one of these extensions, which is bonded for $30,000. The quartz was filled with chloride, brittle silver and free gold. They have refused $50,000 for the other extension. There are about 60 men at work on the original locations bought by P. W. Smith. A large amount of lumber is being hauled to the mine daily, for the use of the mine and out buildings—hoarding house, blacksmith shop, etc. A very rich strike of gold ore has been made about 12 miles from Winchester district.

FINE COPPER PROSPECT.—*Citizen*, Feb. 17: Chas. Odell called this morning with a fine specimen of copper ore taken from a mine called the Yellow Hammer, in the San Pedro district, which he and his co-owner, C. Carlton, are developing. The shaft is down about 30 ft and shows a vein 4 ft wide carrying considerable high-grade ore. The ore averages from 10 to 30% across the vein. This district is coming to the front.

GUNSIGHT.—*Star*, Feb. 17: The ledge of the Gunsight at a depth of 200 ft is found to be 52 ft wide. Near that point it comes in contact with the Silver Dirt vein, which is estimated to be 30 ft wide. The indications are that the two veins will come together as greater depth is reached. It is now estimated that there are $4,000,000 worth of ore in sight, more than enough to build the railroad between Tucson and Port Lobos. The monthly expenditure at the works is now $5,000, and this sum does not include purchases or freights. It costs considerable money to work a shaft 20 by 8 ft in width.

COLORADO.

DUMONT.—*Courier*, Feb. 17: The Unadilla Mining Co., of New York, has let a contract on the Surprise lode, the shaft being now about 40 ft deep. It is the purpose of the company to sink a further distance of 50 feet. Indications point to this property yielding ore of a high grade as the work progresses. So far the ore extracted has proved the character of it to be equal to any that has ever been encountered in this county.

IDAHO SPRINGS.—Meyers & Jenkins are running the Specie Payment stamp mill night and day on ore from the dump of the Crystal mine, which they make pay a fair profit. The new Miners concentrating mill will be completed some time next month.

ANOTHER STRIKE IN THE WIDE WEST.—Another valuable strike was made last Friday in the Wide West mine, on Leavenworth, in the Warren adit workings, towards the south part of the claim. This adit was started last summer and was driven on an ore vein a distance of 235 ft, which averaged in value 183 ounces of silver to the ton. From this adit a winze is being sunk which has followed a continuous ore vein worth 218 ounces. On last Friday this vein opened out to 3 ft of solid smelting ore, and since then in sinking nothing but ore has been removed from the winze. The other parts of the mine, Dr. Warren informs us, continue to look excellent. The last mill-run of nearly 15 tons, netted $4,103.00. The first-class ore milled 715 ounces per ton; the second-class, 287 ounces; the ore from the stope, 246 ounces, and from the Warren adit, 183 ounces.

PROMONTO STEADILY.—The reason why Clear Creek and Gilpin counties produce so steadily and largely is because the mines here are worked at a profit and we do not have to look to "booms" and foreign capital to keep things moving. Our ore market also has considerable to do with our prosperity. Ore as low in grade as 15 ounces of silver to the ton and 20% lead has a market value, while in districts not as accessible to smelting works it is often the case that ore three times as rich must lie on the dump and wait for time to give cheaper transportation rates and more reasonable smelting charges. The most important thing for those who desire to invest in mining property, however, is the fact that mining here has been reduced to a legitimate business; "booms" are a thing of the past, and consequently fancy prices as a general thing are not expected when property is offered for sale. It is safe to say that no other section of the country can offer greater inducements in this respect than old Clear Creek and Gilpin counties.

IDAHO.

ADA ELMORE.—Cor. Wood River *Times*, Feb. 15: On the 30th of last month a very important event in the history of this section of Idaho took place. I refer to the starting up of the new hoisting works of the Ada Elmore O. & S. M. Co. The mine and works are situated about a mile west of this place, on Bear creek. The Ada Elmore mine was among the very first locations made on Bear creek in 1863, and it has since passed through a great many hands before getting to its present owners, Mason & Co. of New York. Since True Rollins took hold of its management the company have expended in the neighborhood of $150,000. The works and mines are now under the superintendence of P. R. Roberts, a gentleman of 16 years experience in mining. Great credit is due both to Mr. Roberts and Mr. Rollins for the present fine working appearance and prosperous condition of the mine. Credit is also due to D. M. O'Sullivan, chief engineer, for the finished condition of the machinery, and the smooth manner in which it works. Also, to D. F. Potter, master carpenter, for the first-class workmanship displayed in the erection of the buildings. Also, to Abel Rowe and Samuel Gerrans, foreman of the mine and shaft, respectively, for the efficient work done under their direction. With the starting up of the new works, the Ada Elmore steps at once to the front rank of Idaho mines, and she will soon claim a leading position among the mines of the Pacific slope.

NEW MEXICO.

HELL CANYON.—*News and Press*, Feb. 16: Mines in Hell canyon, near Albuquerque, are promising. The Star mine, bonded for $50,000, yields $200 in gold to the ton.

DRY WASHER.—A. Bennett's dry amalgamator will not be operated in Golden under 3 months, although under contract to put one in by 15th.

SMELTER.—Las Vegas will have a smelter "in the near future." They claim to have leads near town that give from 29 to 44% copper.

SEVERAL stacks will be added to the Cerrillos smelter, and a roasting furnace for treating copper. There are now 2,500 tons of ore on hand. The Alaska mine in the Black Range has 900 ft of shafts. Three 8-hour shifts are sinking the main shaft, now down 200 ft, to a depth of 500.

TIN.—Tin has been found 9 miles south of Cranes on the A. & P. R. R. in Valencia county. The leads are at an altitude of 8,000 ft, and a district called New Cornwall has been laid out.

BLACK RANGE.—More miners are employed in the Black Range than ever before. Many sales are reported, and a number of mines have been bonded. Argentiferous gray copper was struck in the Eureka on Dry Creek.

SUCCESSFUL.—Shakespeare, Grant county, is happy, the new 30-ton smelter of the Shakespeare Con. M. Co., has started up. It is a success. The smelting ores of silver and copper will be a source of great wealth to the owners of property in that vicinity.

OREGON.

WATER.—Jacksonville *Times*, Feb. 17: The weather in the northern portion of the county seems to be much more moderate than here, and the miners all have plenty of water. Many miners are able to do some work during the day with the aid of reservoirs, but little effective mining has been done anywhere as yet. Capt. H. Kelly returned from Coyote creek this week, who informed us that the miners of that section are taking advantage of an excellent supply of water. H. F. Niday, of Lucky Queen Postoffice, was in town this week. He is engaged in working the Trullinger mine this winter, and says the prospects for a favorable run were never better. B. W. Huston, L. Orme, A. Koster and W. S. King, of Foots creek, were in town this week, from whom we learned that many of the miners of that section are at work, with the aid of reservoirs.

COLD.—The cold snap does not seem to have prevailed continually over the entire county, as Chappol & Co., Oin Lin and other miners along Applegate have been busily at work for some time past with a good supply of water. The cold spell is about over, and the miners will all soon be busily at work, as the ground, which is full of moisture, has thawed out and water is beginning to be plentiful. A favorable spring, with plenty of rain, is also anticipated, and the unusually large amount of snow in the mountains will prolong the mining season. The prospects for a good run are certainly not as gloomy as they might be. The Applegate Oravel Co. is piping, and expects to make a clean up soon. Some of the large hydraulic companies are now cleaning out their ditches. The Squaw Lake Ditch Co. is completing its reservoir and getting ready for active operations. Gin Lin will build a ditch several miles long to bring the water from Palmer creek to the red hills. Wm. Q. Brown, formerly of Althouse, is now in Douglas county on a prospecting tour in the interest of California capitalists.

UTAH.

CHRISTY.—Silver Reef *Miner*, Feb. 11: Recent developments in the California mine have uncovered a large body of high-grade ore on the 400 level north. This level is being advanced as rapidly as possible, and will be intersected by shaft No. 2, on the Maggie ground, which will be sunk an additional 500 ft for that purpose. As soon as this connection is made the two properties will be in admirable condition for handling the large ore bodies expected in each mine.

THE STORMONT CO.—So far during the present year this company has made an excellent record and the indications all point to a future of unequalled prosperity. The lower workings in the Buckeye continue in excellent ore; the stopes in the 4th level, both north and south, are yielding handsomely and have at no time showed to better advantage. The 3d level south is being pushed ahead into the Last Chance ground, and continues in 4 ft of good mill ore, and has now less than 50 ft to make to reach the localities—at some 200 ft greater depth—of the rich and extensive ore bodies that have made that mine so deservedly famous. The 3d level north will be extended 250 ft; a contract has just been let for the first 50 ft, and work has begun. This will make available a very large block of bonanza ground which has been proven by the second level directly above, for that distance. The ore reserves now in sight on both the 3d and 4th levels can be safely estimated sufficient for a 6 months' mill run. A uniform output of about 50 tons per day is maintained, which is raised partially through the Savage shaft.

THE BARBEE & WALKER.—Few mines anywhere can make a better showing than this reliable bullion producer, which sends its treasure forth to swell the commerce of the world with systematic regularity. A new shaft is being sunk on the ledge from the surface at a point 235 ft south from the main incline, which is now down 40 ft; the face is in a strong 4-ft ledge of $50 ore. This shaft will be driven to a connection with the 2d level south. The winze at the extreme north end of the 2d level north continues in good ore.

FROM COLD BASIN.—Messrs. Al. Grant and Don Liddle returned Wednesday from Gold Basin, and speak flatteringly of the mining possibilities of that district. They brought a large number of very handsome specimens of gold quartz, that we would recommend as a remedy for the pink eye. The Patterson 5-stamp mill is crushing an average of about 14 tons of rock per day, but not working the ore to a high per cent.

UTAH MINING.—Salt Lake *Tribune*, Feb. 15: There is very little excitement regarding mining in Utah, but the general result of the past year has been an advance, and the indications now are that the present progress is to increase with steadily swelling momentum. There is no reason why this should not be so. Utah has many advantages over all the country north and west. Supplies, labor, climate and transportation are all in Utah's favor, and when we think of the limited number of men engaged in mining, and consider what the yield has been and is, there is no reason to think that the mines of this Territory are not equal to those of any other region on earth. There are, so far, only two or three mines in the Territory which are really opened; the rest are merely surface scratchings. This, certainly, is not a fair showing, and we believe that mining men are taking the same view and are preparing to do more thorough mining than ever before. There is to be an increase in reduction works, and if present expectations are realized two or three districts which are mostly silent now will soon be making a noise. Then a new road is drawing near from the East, which will place some districts which are remote now, nearer Eastern markets than Salt Lake City itself is. With the coming of that road, conditions will change in many respects, and with its coming many a carload of ore or bullion will make its appearance from districts where only assessment work has so far been done. There will be a boom in mining in Utah by and by, and the time is nearer than many men new believe.

Centrifugal Cream Separation.

Some months ago we gave an engraving and description of a machine invented in Europe by Laval, for separating the cream from the milk by centrifugal motion. There were a number of these machines brought into use in England and on the continent, and one was set up in Massachusetts. The objection to the machine was its limited capacity and the very high rate of speed at which it had to be run—something like 5,000 to 6,000 revolutions per minute. At the English Dairy Show last fall there was a Danish machine shown in connection with the Laval, and exhibited a marked superiority over it. In fact, it seemed to possess a working capacity and feasibility of operation which seem to indicate that centrifugal separation may indeed be available for all dairies of large size. We hear that the Danish machine has already been introduced into Chile, and one of our large dairy managere is now in correspondence with the English manufacturers with the view of bringing one of the new machines to California.

In the consideration of the centrifugal cream separation the advantages of the new over the old system come in question. Of course there will be a great saving in that there will be no setting of milk and no arrangements therefor. The milk, as soon as drawn from the cow, is put through the centrifugal, and an hour or so after milking the dairyman has his cream collected and a stock of sweet, fresh skim-milk for stock feeding or other uses. All spoiling of milk by standing in hot weather is avoided and the whole process of butter making is so shortened that before a following milking the product of a foregoing one is put into commercial form and may be on its way to the market. There are many advantages in such a system of working, which will occur to the minds of all dairymen.

More than this it has been shown by most searching experiments in Europe, that more cream is to be had from the milk than by any of the old methods of separation. In an address before the American Agricultural Association, two weeks ago, Prof. X. A. Willard reviewed the recent investigations of M. Fjord, of Copenhagen, Denmark. M. Fjord commenced a series of experiments for the purpose of determining the relative merits of three different methods in obtaining cream and butter from equal quantities of milk of the same quality taken from one common sample, and the Danish government with commendable liberality appropriated several thousand dollars to the object. These experiments were continued through the entire year, a number of trials being made each month. The methods employed were the German centrifuge of Lafelt and an improved Danish centrifuge on the one hand, and the common shallow pan system of setting milk on the other hand. The milk was taken from a dairy of 200 cows, and after being thoroughly mixed, 600 lbs. were weighed for each experiment. This quantity was divided into three parts of 200 lbs. each; one part being treated with the centrifuge, one part set on the Swartz plan in ice water, and the third part of 200 lbs. being set shallow in common flat pans. The milk which was set in ice water was placed in pails having a capacity of 50 lbs. each, the milk having an average depth of 16 inches, and it remained in ice water for the space of 34 hours before skimming. The regular skimming time for the shallow pans was fixed at 34 hours after the milk had been set, though this was regulated somewhat by the condition of the milk from the end of May to the middle of September, when the milk was allowed to stand only from 22 to 30 hours before skimming.

Without going into all the details of M. Fjord's experiments, showing the careful manner in which they were conducted, the following table, he said, would show the peculiar vagaries of the milk in the yielding of butter by the three systems:

	Pounds of Milk for 1 lb. of Butter.		
1879.	Centrifuge.	Ice 34 Hours.	Shallow Pans.
May	27.6	30.0	30.4
June	25.4	28.3	28.8
July	26.8	28.0	30.5
August	28.5	27.7	31.7
September	26.6	27.6	30.9
October	24.3	28.7	27.9
November	24.6	31.5	28.4
December	24.2	28.5	27.4
1880.			
January	25.8	27.8	28.0
February	26.4	27.4	27.8
March	27.3	28.8	29.5
April	28.3	29.4	30.1

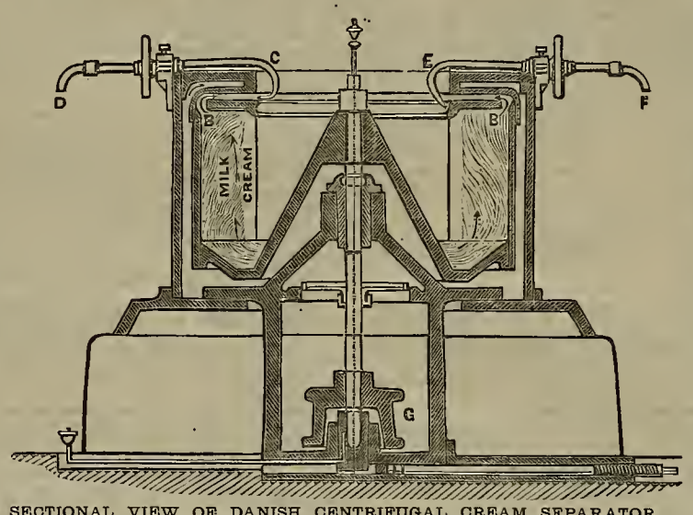
Referring to the figures in the preceding table it will be seen that the superiority of the centrifuge over both the ice and pan system, is especially noticeable during October, November and December, while during parts of July and August it falls below the ice method.

The ice method proves superior to the shallow pan during every month in the year, except in October, November, and part of December, its greatest superiority being in July and August. In October and November it falls below the pan system. The experiments were all checked by chemical analysis which exhibited a close argument with results obtained. The amount of fat left in 100 lbs. skimmed milk resulting from the centrifugal trials, was according to analysis, between 0.25-100 and 0.44-100 lbs. By the ice trials, the 100 lbs. skimmed milk yielded by analysis between 0.34-100 and 1.54-100 lbs., this last extreme being for November milk, when the smallest quantity of butter was obtained. By the shallow pan system the amount of fat in the skimmed milk ranged between 0.40-100 and 1.03-100 lbs.

The average for the year, or out of 12 simultaneous trials distributed over the whole year, was that the skimmed milk on an analysis yielded an amount of fat as follows: By centrifuge, 0.35-100 lbs.; ice method, 0.62-100 lbs.; and by shallow pans 0.68-100 lbs. The superiority of the ice over the pan system is not alone in yielding the greatest quantity of butter, but consists in its easier operation and more certain results in giving a first-class product.

Thus it appears that the shallow pan system which is so general in California is the least favorable to a large yield of butter of the three methods tested. And yet between shallow pans and setting in ice water, there is but Hobson's choice for California, for over the greater part of the State the ice method of milk setting is out of the question, unless artificial ice processes can be made much simpler and cheaper than at present. Possibly the centrifuge may come in to free us from the wasteful pan system and compensate us for the luxury (?) we lose in not having an ice crop to gather every winter. The drawback now is probably that centrifuges are expensive machines, which only rich dairymen with large herds can afford to use, but it is quite likely that a system which possesses such great advantages may be reduced to a cheaper basis so that a farm dairy may have its centrifugal as well as its churn.

In view of this device becoming useful here, we have reproduced a sectional engraving of the Danish machine from one of our English exchanges which will give our readers an idea of its manner of operation. The percentage of cream to be removed can be regulated with the greatest exactness, and this separator runs at only 2,000 revolutions per minute. The whole milk is run into the separator from a tank or



SECTIONAL VIEW OF DANISH CENTRIFUGAL CREAM SEPARATOR.

container. The skimmed milk escapes at B, and is drawn off by the beak and tube, C and D. The cream, when gathered in sufficient thickness, is drawn off by the beak, E, and tube, F. If thin cream be required, the cream is drawn off continuously, but if thick cream is required, the beak, E, is put into work when desired; that is to say, when the wall of cream is seen to be of sufficient thickness. In this power over the quality of the cream consists one of the most valuable points in this machine. The working of the machine is admirable. Looking into the top of the whirling cylinder, the milk and cream are seen standing up in two distinct white walls around the vessel, and a couple of brass tubes dipping in run off the two products as they collect inside.

A Comstock Ruby.—Very little search has ever been made in this State for precious stones of any kind. The fact that a very fine ruby, which weighed about one carat when cut, was found at Cedar Hill at the time they were mining there by hydraulic process will probably be news to most of our people, yet such is the fact. The stone, in the rough, was bought by John Rothenbucher, a jeweler, still in the city, who sent it to New York, and had it cut. It was of a fine claret color and of the first water. Mr. Rothenhucher informs us that some very fine rubies are found in Idaho. He now has in his possession some of them in the rough, just as he bought them. Rubies are next in value to diamonds.—*Virginia Enterprise.*

How Drift Mining Doesn't Pay.—A few days ago the Derbec Blue Gravel Mining Co. shipped to the bay bullion to the amount of $9,500. This is a drift mine and is worked in the same manner that the Sacramento *Bee* and Marysville *Appeal* would like to have the Excelsior, Blue Tent, North Bloomfield, Milton, Eureka Lake and other hydraulic mines. The point of this reference becomes apparent when it is known that last month the expenses of the Derbec were $11,000, leaving the stockholders to pungle up an Irish dividend of $1,500. Drift mining pays—to leave alone.—*Nevada Transcript.*

Gold in Australia.

There appears to be a genuine revival of interest in the Australian gold fields and an increase of expectations therefrom, which cannot fail to be welcome in the present position of what may now be called the gold question. The Melbourne *Argus* says that the various gold fields of Victoria continue to attract much attention, and a large amount of Melbourne and other capital is being invested in prospecting in almost all directions over the auriferous districts. Several of the well-known extensive quartz mines of Sandhurst have recently yielded such rich stone that a considerable rise in the prices of the shares of a large number of Sandhurst mines has resulted. The industry is also said to be steadily improving in the Beechworth district, and some of the reefs lately discovered there are giving very satisfactory results. Increased attention is likewise being given to the Wedderburn district. The large yields obtained for some time past from the deep alluvial mines at Kingston and in the Smeaton district are being kept up, but the usual difficulties which spring up where gold has to be obtained by sluicing and washing operations are affecting these and other large mines in the colony. An injunction has been obtained by a Mr. M'Kenzie, a land-owner, against the Madame Berry Co., to prevent the latter from spoiling the water of a stream which runs through his land by sluicing from the mine. The effect of this injunction is to prevent the company from working the mine, and a large number of men have been thrown out of employment in consequence; and it is feared that if other land-owners take the same course of action gold mining may be stopped in the colony altogether. The Madame Berry Co. have issued a writ against Mr. M'Kenzie claiming damages to the extent of £20,000 for the latter having "unnecessarily forced down the value of the company's stock in the market, when a more simple remedy, in which the company might, and, as is alleged, would have readily acquiesced was open to him." The Government meanwhile have introduced a bill "to give mining companies power to enter upon either Crown or private lands to make dams and reservoirs in which sluice may be collected instead of being run down water courses, compensation, of course, being paid for any injury done to the lands by the making of the dams or reservoirs." The hill is also intended to prohibit mining companies from running sluice into rivers or creeks at all; but this provision is strongly opposed by members of the Victorian Parliament representing mining districts, on the ground that it will stop mining. It has since been stated that a compromise between the Madame Berry and other companies and the land-owners concerned has been effected. The New South Wales mines are also said to be constantly showing new signs of richness.—*London Mining Journal.*

The latest news from Ivanpah, says the San Bernardino *Index*, is that the mines there are being worked with very good results. The last strike in the Alley mine was a very good one. Several tons have been taken out that work $2,000 to the ton. They are now taking out a lot of ore from the old works that was not considered worth doing anything with when it had to be shipped away to be worked, but it can be worked now to very good advantage, as it is easily got out. About a hundred tons of it can be taken out at little cost, and it works $175 per ton.

A Novel Way of Making Ice.—Some Norwegians who settled in Quigley's gulch, about a mile from Hailey, last summer, have been making ice in a novel way. They got a lot of coal-oil cans which they filled with water from the creek, and left them outside during the night. In the morning they would punch a hole through the ice, let out the water, and thus get hollow blocks. They have a log house, 20x40 ft., filled up with ice made in this way, and are still at it.—*Wood River Miner.*

Central America.

A Miners' Paradise Found in Honduras.

Under date of January 25th, John S. Jones gives the Chicago *Mining Review* a long account of a trip he recently made to Honduras. He landed in Truxillo, a city over 300 years old, founded by Cortez. Mr. Jones then proceeds to say:

On presenting my credentials to the chief magistrate I was at once introduced to the chief officials, and, on making known my business, I was allowed to pass all my supplies and tools free of duty, which was quite a great favor, as the usual duties are almost prohibitory—pork is charged about $15 per barrel, and flour $3 per barrel. As soon as we procured mules we left for the interior, and, after five days' travel over a beautiful and romantic country, reached Olanchito, distance 100 miles, in the Department of Yoro, located in the valley of Olanchito, on the river Ajuan, a stream carrying 5,000 miners' inches of water in the dry season. About 40 miles from Truxillo we found undergrowth and brush almost impenetrable if you left the trail. Mahogany, cedar and a variety of other timber is very abundant in the valleys. The soil is a black loam, extremely rich. The balance of the route was through open, beautiful valleys, with abundant clear, cool streams of rapid-running water. The foothills are lined with pine timber. The route thence to Arnal is level and rich in verdure. At this point we reach the mountains proper at an elevation of about 2,500 ft. Here are found rich gold veins in quartzite formation. Timber and water are here in abundance. The next point of interest was Ocon, a town of about 1,000 inhabitants, located in a valley surrounded by mountains, which contain, without doubt, immense mineral wealth. From this point over the mountains to Manquallio is a distance of 40 miles. The inhabitants here are somewhat more thrifty in their habits. In this place gold is found in quartz, and also in the gravel deposits. We then proceeded to Yocon, about 18 miles, having crossed the river Manquallio 22 times. This city contains about 2,000 people. I found a rich vein of copper near the city. We then went to Juatalapa, the capital of the Department of Olanchito, containing 5,000 inhabitants. Here I had the honor of meeting Governor Don Santiago Mesa, also Don Floilan Turewe and ex-Governor Jose M. Aguerre, to all of whom I feel under lasting obligations for the many courtesies extended to me in that far-off land, and from whom I gained much valuable information. This city is located on the Guyape river, which is one of the most important rivers in Honduras, navigable to within a short distance of the city for light draft boats. The mountains surrounding this place show great indications of mineral wealth, and the gravel deposits above and below are, without doubt, the richest placer diggings now lying dormant, and, by a system of hydraulics, could be made the most profitable mining enterprise that ever was known to man. The climate in this locality is most beautiful, being at an elevation of from 3 000 to 4,000 ft. above the sea. It is very healthy, and most advantageous to those of weak lungs, as it is never colder than 50° nor warmer than 90°. The rainy season commences in September and extends into the middle of November. This is the least desirable season. The inhabitants of Honduras extend an open hand to all Americans, and seem anxious to adopt American ideas. The President is elected every four years. United States laws are followed closely. Tegucigalpa is the capital of Honduras—population $15,000. The present Executive is Marcus A. Soto, a progressive, go-ahead man, who does all in his power to encourage the natives in making improvements. A telegraph line is now in operation from the coast to the capital. The natives are very docile and peaceable, and seem to be anxious to have Americans settle in their country, and treat them always with great hospitality. The placer beds are immense, and when machinery is placed on them the production will be incalculable. A grand opening is offered to young men of energy and business ability, requiring but little money to make a large fortune. I propose returning to Honduras in a few weeks.

Dolores Mining District.—Among the many rich and favored parts of the State of Chihuahua—where now American prospectors, backed by American money, are seeking to uncover the hidden mineral wealth, and where all sources for gold and silver are being made more valuable by increased production under improved appliances—one district is coming prominently to the front. Within the past few months quite a number of our enterprising citizens have become interested in mines of this fabulously rich section. A stamp mill, of small capacity, however, was shipped to Tomasichie by a company formed here. This event drew considerable attention to the mines of that locality. Dolores district, though distant from Chihushua City, the mining center of the State, includes a country of wonderful resources, not only of a mineral nature, but timber land, grazing ranges, as well as an abundance of water. —*Link.*

The Central mining company paid a dividend of $2.50 per share in New York on the 4th. This is the 20th dividend, and the total is $1,010,000. The mine is a copper claim in Michigan.

Barely Prospected.

The part of Southwestern Nevada which is compriced in the counties of Esmeralda and Nye and that part of Southeastern California of which the counties of Mono, Inyo and San Bernardino are a part, has been, within a few years, a region of country comparatively but little known. The hardy prospector, of course, had run over the entire region more than 20 years ago; but with the exception of at a few points, widely separated, he made no discoveries worthy of note or from whence resulted anything to bring into prominence the mineral wealth of that particular part of the Pacific Coast. Of course, Aurora was an exception 20 years ago, and for three or four years its fame spread. But oblivion came, and until the resuscitation of Bodie no attention was paid by the masses to this entire country. During the past four years, however, startling changes have taken place,—but startling only in a small degree compared with the changes the next four years will bring. This entire region spoken of has been difficult of access and costly to penetrate. The most sturdy prospector had his nerve and muscle severely tired during his endeavors to expose some of the wealth in its mountains. This state of affairs is gradually changing, and one of the most potent factors in causing this change is the railroad system now traversing this part of the country. This railroad system is yet only in its infancy, the Carson and Colorado being the advance guard and pioneer. When it will have penetrated another 150 miles further into the wilderness the scope of country which will be thrown open to the prospector and miner will simply be illimitable in extent and mineral value. The pioneer prospector has already proven that in all these mountains and valleys are contained minerals of all kinds and descriptions. With railroad facilities these early discoveries will be again brought into prominence and developed; new ones will be made, and a country that is now barely supporting a few hundred people will increase in population and progress until the output of its gold and silver bullion, its borax, soda, salt, coal, mica, nickel, lead and other valuable treasures of nature—which are here in abundance awaiting development—will be so great that the attention of not only this immediate people, but also the attention of those distant from here will be called to the mineral resources of this part of Nevada and California. The daily increasing facilities for exploring the country will also be shortly felt, and from Walker lake on the north to the dried plains of San Bernardino on the south, and from Grantsville on the east to Fresno flats on the west, the mountains will swarm with prospectors before 12 months. In a comparatively unprospected region this state of affairs will certainly produce some good results, and the discoveries that are liable to be made will materially assist in the development of a now almost unknown country.—*Candelaria True Fissure.*

Sweetwater District.

A correspondent of the Esmeralda *Herald* of the 4th instant, says: I am pleased to give you the progress and status of the Sweetwater Mining District at this date.

The Summers mine is working a full force of men night and day, with Mr. Matt. Young as foreman of the mine. The ore is improving in quantity and quality, which the developments have shown in the last ten days, and the ore that is now exposed is better than was ever shown in the mine. There are 350 tons of first-class ore at the mill, which is situated two miles east of the mine. The mill is running at full capacity—five stamps, one pan and one settler. The mill is under the supervision of Mr. James Laraway, assisted by Mr. A. Soderling, of Bodie. They report the ore working up to 85 and 90 per cent. The mill has only been running at its full capacity a few days. On January 30th they made one retort of 45 lbs., and January 31st one of 55, crude bullion, and to-day will make the first bar of bullion of about 1,000 ounces, which I think will be about 900 fine. The value of the bar will be $1,200. When everything is in good order they will ship more silver bullion from their 5-stamp mill than any other 5-stamp mill in the country. The town of Pattersonville, which is situated near the mill, is improving very rapidly, many new buildings being in course of construction.

Mill Runs.—The unreliability of specimen assays to demonstrate the value of a mine, has received such general and merited denunciation at the hands of the mining press, that people have of late placed but little confidence in reports of high assays. The latest dodge now is to expatiate on high results given by mill runs, as having a tendency better to deceive. We notice in the daily exchanges reports of mill runs on various properties giving results all the way from 100 to 10,000 ounces, from properties that have not a pound of pay ore, and many of them have never mined a ton from their entire workings. The way this is done, the parties developing save every particle of high grade ore material for months, and perhaps after accumulating a sack or two out of 100 ft. of working that has cost not less than $1,000, they take their sample to the mill, have it run through and get the assay of the same, and then endeavor to gull the credulous with sensational reports of a big mill run.—*Kokomo Times.*

Useful Information.

Solid Petroleum.

The conversion of Petroleum into a solid and safe substance for transportation seems to be attracting considerable attention in foreign countries where no pipe lines exist. A St. Petersburg paper says: How shall we transport petroleum? is to-day the most important question for all branches of the naphtha industry, and no less so for the consumers who live at a distance from the wells. All the methods of transporting petroleum hitherto in use, whether in wooden or paper barrels, in iron pipes, or iron caissons that are placed on ships or cars, possess disadvantages which are sufficiently well known, especially as regards leakage and evaporation, and also the great danger from fire.

These misfortunes which afflict so severely both dealers and consumers and increase the cost of an article of such importance in domestic economy, have been banished at a single stroke by the discovery of a German named Dittmar, who has succeeded in converting liquid petroleum into a solid substance. As early as 1872 the idea arose in America of solidifying petroleum so as to put it into a more suitable form for transportation, and in that year no less than 12 patents were taken out for this object without any single one of them being found practical. What a range such a discovery would cover, as would change petroleum into a solid wax-like body, can scarcely be conceived of, especially for the Caucasian naphtha industry, where there is a lack of suitable wood for making the barrels, which has a very serious effect upon the industry.

The Moscow *Zeitung* also contains a thorough discussion of the new invention. The journal says: Solid petroleum has not yet come into market because the patents have not yet been issued, but a company has been formed in Russia for carrying out the invention. By the process adopted by this company it is claimed that a quantity of petroleum, which would involve an expense of $36 to put it into proper cases for transportation, including the loss of leakage which would naturally ensue, might be rendered solid at a cost of only $4.

But to this and other remarks that have appeared in the technical journals the Russian *Pharmaceutical Zeitschrift* adds the following: It is found that petroleum when heated will take up a certain quantity of dry soap, and that the solution on cooling will form a jelly, which, when ignited, drops off in pieces that soon go out like burning sealing wax. Dilute acids, like acetic acid, restore the fluid condition (evidently owing to a decomposition of the soap). In this way is explained all that has been asserted and claimed for the solid petroleum.

Only 1½% of soap is required to form a gelatinous mass like opodeldoc, but with 3% of soap it is much more firm. In this operation there separates a small quantity of liquid products that do not become solid, and which probably consist of the lower boiling constituents of petroleum. The presence of these in the solid mass, is, of course, dangerous, and still more so because it always has to be liquefied before it is used. The contents of the wooden boxes used in transportation, will soon ooze through the wood and becoming mixed with air will give off explosive vapors. On this account the author comes to the conclusion that the advantages of solid petroleum are entirely imaginary, as being a tedious, troublesome, expensive and dangerous operation.

What is an Apple?

Is an apple a fruit? It is generally regarded so; but, botanically speaking, a *fruit* is that part of a plant which contains the seed, and it is nothing else. The *core* of an apple, then, according to this, is the true fruit, for that is the part that contains the pips, and the pips are the seeds. It is a cartilaginous five-lobed capsule, splitting along the edges. "What oddities," says Dr. M. T. Masters, "these botanists are; they leave on their plates the fruit, and they eat something which they say is not the fruit! What is that something which is not the fruit? To answer this question to his own satisfaction, the reader should see before him a flower of an apple or pear in the earliest stage of its growth, and he should trace in other stages, from this earliest condition to the ripe state, the growth of the apple or the pear."

"A careful examination of this kind," says our author, will "enable him to discover that the flesh of the apple or pear is nothing whatever but the end of the flower stalk, which gradually swells out into a succulent mass, and which holds embedded within it the true fruit—the core. What in ordinary language is called the fruit is, then, only the swollen flower-stalk. Alechemillas and spiræas, peaches and cherries, are not to be had in flower just now, else a cut down through the center of the flower of either of these would reveal the cup-like stalk encircling the young fruit in the center, just as a pill is inclosed within a pill box. Now, suppose the cup to be fleshy, and so thick as to come in contact with the fruit, and we have exactly the condition of an apple. So, then, to say that the core of an apple is the true fruit, and the flesh thereof the dilated flower stalk, is no dogma to be accepted as an article of faith, but it is a statement which anyone with a pair of eyes, ordinarily nimble fingers, and a little patience, can, at the proper season, verify for himself. To be able to recognize the core of an apple as the fruit proper, and to see in the flesh of the apple a swollen flower stalk, is not to indulge in a mere botanical technicality, as some might at first be inclined to suppose, but it affords a means of ascertaining a truth, and, as such, of opening up possibilities of future utility and development; for truth is never barren of result—the sterility lies with the man who does not avail himself of the truth so far as he can. Deep thoughts to be evolved from the castaway cors of an apple!"

How to Make Peppermint Drops.

Take a convenient quantity of dry granulated sugar; place it in a pan having a lip from which the contents may be poured or dropped; add a very little water, just enough to make the sugar a stiff paste, two ounces of water to a pound of sugar being about the right proportion; set it over the fire and allow it to nearly boil, keeping it continually stirred; it must not actually come to a full boil, but must be removed from the fire just as the bubbles denoting the boiling point is reached begin to rise. Allow the sirup to cool a little, stirring all the time; add strong essence of peppermint to suit the taste, and drop on tins, or sheets of smooth white paper. The dropping is performed by tilting the vessel slightly, so that the contents will slowly run out, and with a small piece of stiff wire the drops may be stroked off on the tins or paper. They should then be kept in a warm place for a few hours to dry. If desired, a little red coloring may be added just previous to dropping, or a portion may be dropped in a plain white form, and the remainder colored.

There is no reason why peppermint should alone be used with this form of candy, but confectioners usually confine themselves to this flavor. Any flavor may be added, and a great variety of palatable sweets made in the same manner. If desired, these drops may be acidulated by the use of a little tartaric acid and flavored with lemon, pineapple, or banana. In the season of fruits, delicious drops may be made by substituting the juice of fresh fruits, as strawberry, raspberry, etc., for the water, and otherwise proceeding as directed.—*Confectioner and Baker.*

Solidifying Wines.—An Italian has invented a process for solidifying wine. From a small quantity of this extract may be obtained a bottle of generous wine of good taste and beautiful color. The object is to victual ships and supply armies. A chemist in Marseilles has found a combination by which he can solidify and even crystallize brandy. The brandy in its new form looks like alum. It entirely loses its smell. The facility with which it can be transported is of course the main recommendation of the new invention. An Oregon inventor, some six years ago, took out a patent for solidifying cider, which appeared to work very well. It was solidified by being thrown in a spray upon a heated revolving cylinder, from which it was afterwards cut as a sheet of solid cider. Some specimens were exhibited at the Centennial Exhibition at Philadelphia, in 1876, and attracted much attention.

Good Health.

An Anti-Malarial Plant.—In lectures on medicine by Dr. Thomas Watson, delivered in 1847, speaking of malaria, he says: Dr. St. Cartwright, of Natchez, asserts that the *Jussieua grandiflora*, or floating plant of the bayous and lakes of lower Louisiana, has the power of preventing the development of malaria in regions particularly adapted to its generation. He affirms that it purifies all stagnant water in which it grows; that the lakes and bayous inhabited by it, being as pure to sight, taste and smell as if it had just fallen from the clouds. He ascribes to the presence and peculiar hygienic or health-preserving properties of this plant the remarkable exemption of the inhabitants of lower Louisiana from malarious or miasmatic diseases. The fact, he remarks, that the region of country in which this aquatic plant abounds is exceedingly healthy, can be established beyond cavil or doubt. It nevertheless contains more stagnant water and swamps than any other part of the United States. One of our readers asks us what is now known concerning this plant, which was put forth as a malaria-killer in 1847, and whether the observation given above is substantiated by facts. The best we can do is to appeal to those acquainted with the botany and health of Louisiana to inform us. If there be such a sovereign remedy for malarial country, it should be generally known. Who will tell us about the *Jussieua grandiflora?*

Put it on at Once.—A loose red woolen flannel shirt should be worn next to the skin, both summer and winter. It must be "loose," so that its moving upon the skin may keep up a good circulation there; "red," because white flannel fills up, becomes stiff and impervious; "woolen," because woolen flannel conveys the perspiration from the under to its outer surface, where either the cotton shirt absorbs or the air dries it without injury to the body. On account of these properties, sailors wear woolen flannel even during midsummer in hot countries. Of course, a very thin material should be worn in summer.

Nature of the Diphtheritic Contagium.

In the spring of 1880, Drs. H. C. Wood and H. F. Formad, under the auspices of the National Board of Health, began a series of experiments upon rabbits with a view of determining the nature of the contagium of diphtheria. The animals were inoculated with diphtheritic membrane taken from the throats of human patients.

In the course of these researches, it was determined that there is nothing specific in the production of false membrane in the trachea, and that traumatic pseudo-membrane accurately resembles the diphtheritic, except that micrococci are not quite so abundant in it. The experimenters conclude that the disease produced by the diphtheritic inoculation was really rabbit diphtheria, because the poison giving rise to it, the symptoms during life, and the *post-mortem* lesions were identical. In addition to this, the contagiousness of the disease was retained. They accept the experiments of Curtis and Satterthwaite, showing that the infectious character of diphtheria depends upon the solid particles of the membrane; furthermore, their researches lend them to conclude that the micrococci are in close relation with the essential poison of diphtheria, being either the virus itself or the producers of it. The results of culture of these bacteria lead them also to assert that there is no difference between the micrococci of simple sore throat and those of diphtheria, except in activity of reproduction; the two are the same organism, existing under different conditions.

Drs. Wood and Formad believe that the vitality under artificial culture is in direct proportion to the malignancy of the case from which the plant is taken. They have succeeded in producing diphtheria by the inoculation of cultured micrococci, but never with those of a generation later than the second.

M. Pasteur has indicated that an inert organism may become virulent, and *vice versa*, and in the same way they believe themselves able to prove that the micrococci of the mouth are really identical in species with those of diphtheria. That oxygen may be potent in converting a virulent into a non-virulent organism, they regard as probable, from the effects of exposure of dry membrane. The micrococci of a catarrhal angina or trachitis may, under favorable circumstances, be transformed into micrococci of diphtheria, and a self-generated diphtheria (*i. e.*, endemic) ensue; or external conditions may favor the transformation of inactive into active organisms, and these may lodge in the trachea and also cause diphtheria (*i. e.*, epidemic). In the first instance, the disease may spread by organisms exhaled by the breath. Diphtheria will vary in contagiousness according to the development of the virus—malignant diphtheria will be more contagious than the mild endemic form. The conditions outside of the body which favor the transformation of inactive into active micrococci, and agents destroying these organisms, remain yet to be studied.—*Phila. Med. Times.*

A Skin Tinged with Yellow, that is, abnormally so, is the outward and visible sign of a lack of regularity in the performance of the bile-secreting function, and that the biliary fluid has strayed from its proper channels, impeding digestion, disordering the bowels, and producing aggravating internal disorder. No time should be lost, under such circumstances, in resorting to the standard anti-bilious remedy, Hostetter's Stomach Bitters, the good effects of which are in nothing more conspicuously shown than in its reformatory action upon the great bile-secreting organ. Renewed activity, when the liver is sluggish, a regular action of the bowels, the disappearance of sick headaches, heartburn, flatulence, and pain in the region of the organ principally disturbed, may be anticipated with just confidence by any bilious subject who begins with a course of this peerless regulator, and debilitated or nervous sufferers experience the greatest benefit from its tonic influence, while its efficacy in rheumatism and kidney weaknesses is equally well authenticated.

Deaths from Singular Causes.—Two distinguished men have just died in Paris from a singular cause. Col. Adan, Director of the Institute Cartographique, thought he had a chair behind him, and in sitting down fell with all his weight on the floor. He died within a short time from the effects of the accident. About 10 days before M. Pirson, Governor of the Banque Nationale, went to a dinner party at the Spanish Legation, and sat beside the hostess. She rose from the table, and then, continuing a conversation, resumed her seat. M. Pirson followed her example, but a footman had meanwhile removed his chair, and in his fall he injured his spine and survived only a few days.

Hygiene of Beds.—Beds should be made of such material as will absorb as little as possible of dampness or impurities of any sort. One of the most important means of keeping a bed in a wholesome condition is thorough airing every morning. Immediately after rising, the occupant should throw open the bed and the windows of the room, thus securing a thorough removal of the foul emanations from the body which accumulate during sleep. When this is not done, the foul products accumulate, and the bed may become a source of disease.

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SAN FRANCISCO:

Saturday Morning, Feb. 25, 1882.

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Business Announcements.

Amalgamating Plates, Chicago Plating Co., S. F.
Wanted—Mining Manager for Quartz Gold Mine.

Passing Events.

As we have stated in another column, the prospects of the coming season have become assured as favorable, owing to the abundant snow-fall in the mountains, much to the pleasure of the miners. It will not now be long before the unfortunate litigation concerning the hydraulic mines will be settled, when, it is to be hoped, all will go smoothly again.

Up on the Comstock, the quartz mining center of the coast, the shutting down of work on the Forman shaft is not encouraging. The works have been shut down pending the settlement of financial matters with the Belcher and Crown Point, which companies are partners in the shaft, and who are behind in their payments toward the cost of sinking. It was the intention of the Crown Point and Belcher companies to clear out the drift connecting with the Yellow Jacket, on the 282S level, and work through that, but owing to the water troubles at the Jacket this cannot now be done.

Washington's birthday, which occurred this week, was quietly celebrated in the city. In the country there is far more of the holiday feeling prevailing than seemed possible a short time ago. The rains have been general and though not generous have cheered all by their present effects and by the promise of more as growth requires it. There is reason to expect a very good year throughout the State, and an aggregate of produce which will be creditable. Here and there a district will probably but hold its own and require courage to wait for another more productive season, but the general outcome of 1882 will be better than has been hoped for during the earlier portion of the winter.

Wire Mine Models.

The French mining engineers have a system of presenting a relief, and, at one view, the form and features of the surface and the subterranean works of the mines at their proper relative depths beneath the surface.

The method consists in producing the form of the surface in equidistant contour lines represented by wires of sufficient strength, the contours being taken in regular intervals of vertical distance, and the horizontal wires being held in their relative position by other wires joining them transversely in such a manner as to form a design presenting the relief of the surface.

To make a model of this sort a map of the surface is first prepared, on which the contour lines are carefully drawn. Each of these contours is then reproduced in brass wire. In order to place these contours in their proper relative position, a series of profiles on wood is employed, formed of thin boards set up vertically and parallel to each other, each cut on its upper edge so as to form the profile of that part of the surface of which it represents a section. The contour curves in use are placed upon and supported by the system of profiles; and after being adjusted precisely to their proper relative position, are joined together by other smaller wires, so placed as to bind the network firmly, and at the same time to represent other features of the surface, such as the crests of the ridges, the beds of the ravines, the boundaries of the properties, the lines of the roads, the courses of the streams, etc.

Upon this network it is then easy to place the representation on the desired scale, of the principal buildings on the surface, removing finally the wooden profiles from underneath, and substituting for that means of support a sufficient quantity of small uprights of the desired length, and at convenient points.

The underground works of the mines may be shown in similar manner. The various drifts, tunnels, and cross-cuts are represented by horizontal wires, each having the form required to correspond to the course and length of the work represented by it.

The horizontal wires being placed in proper relative position beneath the surface net, are connected with other wires corresponding to the shafts, inclines, winzes, etc., and other accessory works of the mine, the whole being also supported from below by uprights placed at convenient points.

At the same time, the surface wires and those of the underground works can be made to show the main features of the geological formation by coloring them with different tints indicating the various rocks exposed on the surface or traversed by the mining works below ground. The form of the surface, its nature expressed by color, and the relative position of all the objects shown upon it, are brought out in bold relief, while the spaces between the wires afford a clear view of all the works lying beneath.

At the time of the last Paris exposition, a French mining company exhibited a plan of this sort, the subject of which comprised a superficial area of about three miles long by two miles wide, beneath which were represented a portion of the underground work of the collieries and iron mines belonging to the company.

This plan seems better than the plaster or models. Some excellently-made glass mine models, by the way, are shown at our State Mining Bureau. From the description we have given, anyone of ordinary skill can construct a wire mine model.

Prospects for the Coming Season.

The abundant fall of snow of the past few weeks has been most welcome to the miners of this State. Throughout the mining regions, the mountain tops and the canyons are covered and filled with snow, insuring an abundant supply of water for the coming season. Of course, in many places this has stopped work and stopped prospecting, but both will be prosecuted again with renewed vigor at the first opportunity. Altogether, the prospects for a good year of mining are very favorable, and the miners feel encouraged to stick to their claims. As an index of what the feeling is in this respect, we take the following from the Greenville (Plumas Co.) *Bulletin* of last week: "For weeks past the town has been quite dull, but already a change is seen. The certainty of having plenty of water has dispelled the gloom, and already evidences of active preparations for energetic work are evident. The success of prospectors in the fall has excited a good deal of interest; so much so, that some mechanics talk of giving up their regular occupation as soon as spring opens, and going after quartz. Some transactions that have been made lately in connection with some of the mines in the neighborhood have given warrant to the belief that the coming season will witness an unusually vigorous display of mining in the district. Nothing is now needed but a few days of warm weather, or a little rain, to set the snow melting, and all the mills in the neighborhood will be running."

IT is said that the expense of running the largest size furnaces at the Richmond works, including the price of extracting the ores, charcoal, wood, labor, hauling, and other incidentals, is $1,000 per day.

Ditches and Canals.

A Calaveras County Work.

For conveying water to the mines a ditch system of very great magnitude has grown up in this State, and millions of dollars are invested in this class of property. Few people who have not examined the subject are aware of the engineering difficulties overcome in building these ditches, or of the expense entailed in carrying on the work. All along the lines of the ditches small villages and camps spring up, where live the families of the men who are engaged in the mines. Without these ditches the mines themselves, in most cases, would be of little or no value, since it is upon the water they depend to be worked. In fact, were it not for these ditches a good many parts of the State would hardly be settled up. The storage reservoirs, forming part of the system, keep back the water from the melting snows for utilization during the dry season. Thus the mines can be worked during months when there would otherwise be no water. Concerning the building of one of these ditches the following information is forwarded to us from J. S. M., at Copperopolis:

I had the curiosity recently to visit the canal built by Mr. L. J. Lewis on the banks of the Stanislaus river, Calaveras county, and was surprised to find so large an operation progressing and so little stir made about it. A 12-horse power boiler was set on wheels, a movable track in two sections was laid, and the boiler run down the canal as it was built; the steam made was used to run a No. 3 Ingersoll drill, which, with quantities of Excelsior and Giant powder, made the hills reverberate and shake to their foundations. About 50 men have been employed several months in blasting out great ledges of metamorphic and other slate rock to the depth of 12 or 13 ft., averaging 9 to 10 ft. wide, besides cutting through cement sand about the same depth and width for a long distance.

At the head of the canal a flume 8 ft. high and 15 ft. wide is built of two-inch plank, with base timbers 12 inches square, strongly bolted deep into the bedrock with one-inch iron bolts, and the whole encased to the top by a stone wall six ft. thick. At the head of the flume are four gates for the ingress of water. From the flume to the first high reef of rocks there is a double (chambered) wall 660 ft. long, 10 ft. thick on the bottom and 6 ft. thick on the top, strongly tied at intervals with heavy rocks, and the chambers filled by running loam into them with a small head of water, making the wall as solid as the hills. In this manner the wall has been built along the line of the canal, presenting a formidable appearance and proof against flood and storm. The object of the canal is to take all the water from the Stanislaus river eight or nine months in the year, that the river bed may be cleared of its gold and that the bare may be worked; also to furnish water power for mills that are to be erected to work the great bodies of quartz in the mines contiguous to the canal, and which will furnish 500-horse power when finished, one and one-half miles from the head. This is the largest canal in this part of California, and reflects great credit upon the builder and the capitalist interested in the operation.

Quicksilver Production in Spain.

Through the kind attention of his correspondent at Almaden, Spain, Mr. J. B. Randol, general manager of the New Almaden mines, Santa Clara county, is enabled to place at our disposal the accompanying statement of the production of quicksilver at the famous Almaden mine for the year 1881.

As usual there was no work in June, July, August and September on account of hot weather. It will be observed that the production is given in kilograms, as 1,737,571,600 and dividing this amount by the number of flasks—50,353, we have as the contents of each flask 34,507 kilograms, which, at 2.2046 lbs. avoirdupois to the kilogram, gives the contents of the flask or bottle in English weight 76.07 lbs., or 4.03 of a pound less than is contained in the New Almaden "A" brand, which latter have a guaranteed weight of 76.50 lbs. net. To large consumers and close buyers this difference of weight and quantity in favor of the product of the New Almaden may be found worthy of note and we therefore call attention to the fact.

QUICKSILVER PRODUCTION OF THE ALMADEN MINE (SPAIN) DURING THE YEAR 1881.

Months.	Production in Kilograms.	Equal in Flasks.
January	251,503,400	7,288
February	223,961,100	6,490
March	273,743,200	7,933
April (29 days)	250,873,200	7,270
May (19 days)	192,400,200	5,578
June	.....	.....
July	.....	.....
August	.....	.....
September	.....	.....
October (12 days)	96 550,300	2,798
November	220,876,700	6,401
December	227,573,500	6,595
Totals	1,737,571,600	50,353

Equal to 34,507 kilograms per flask.

N. B.—34,507 kilograms at 2.2046 lbs. avoirdupois=76.07 lbs. avoirdupois. 75 lbs. Spanish at 1.014331 lbs. avoirdupois=76.07 lbs. avoirdupois.

IT has been proven that as a rule sagebrush or Juniper wood at $10 per cord cannot be used profitably to run quartz mills.

Quartz Mining in the Vicinity of Auburn.

The most important of the mines is the St. Patrick or Crater Hill. From this mine, or rather from its San Francisco management by stock sharps, the district owes what is known among the mining fraternity as its "black eye." Under the aforesaid management, as soon as the manipulators had unloaded the stock at a high figure under the influence of large mill returns, the ledge was lost (?) and assessments levied till the stock was again secured at a low figure. The ledge would then be found, dividends resumed, and the stock raised high enough to make a repetition of the operation profitable. This method of mining several times repeated became monotonous to investors, and the mine running behind under poor local superintendence, was attached and sold under execution. Since the sale, the mine has only been worked occasionally, but has nevertheless paid its purchase price, about $17,000, and some additional amount in dividends. The mine is worked through an incline shaft to a depth of 700 ft., this being the only shaft in the district over 200 ft. deep. Steam hoisting works take the ore out of the mine. The amount of water in the mine is comparatively insignificant, barely enough being obtained in summer time to supply the boilers. The ledge near the surface was at times quite narrow, particularly in passing through a belt of extremely hard rock from 100 to 150 ft. in depth. Below that it widened to from 2½ to 3 ft., and even more, occasionally. A pay-chute about 400 ft. long was found pitching to the east. It has been followed and worked to the east line of the mine down to the 700 level, where it passes out of the mine into the east extension owned by other parties. In the bottom of the shaft, another chute is coming in from the west, and at the present time, the shaft is being retimbered, with a view to sinking deeper and opening up this body of ore. The total yield of the mine has been in excess of $600,000.

Other important mines in the granite formation are the St. Patrick Consolidated, the Gold Blossom and its several extensions, the Mammoth and the Bowlder. All of these have been worked to some extent but to no great depth. The St. Patrick Consolidated being the east extension of the Crater Hill, is undoubtedly a valuable property, receiving from the 300 to the 700-ft. levels the great pay-chimney of that mine.

The principal differences that exist in the quartz veins that have been described, are most prominent in the mineralogical composition of the ores. Pyrite is found in greater or less quantity in all the quartz veins; in the slate formations it occurs principally in the common cubical crystallization; in the Bellevue and Crater Hill and other mines, in the granite, it often occurs in brilliant, highly-modified crystals. It is almost invariably accompanied with gold, particularly in veins in the granite. Chalcopyrite is also common but is most often found in ledges in the granite. Galena is even more common than chalcopyrite, and is found accompanying the other two. In the Conrad mine crystals of galena are found containing flakes and wires of bright gold. In nearly all mines in the granite the galena carries considerable gold, probably more gold than silver. This fact renders the treatment of these ores quite difficult. Heavy sulphureted ores assaying high figures fail to yield by the ordinary mill process one-tenth of their assay value, the bulk of the gold being run off into the tailings. There is no good reason why this should be the case. With battery amalgamation (not practiced at present) and proper sulphuret concentrators, these ores should be made to pay extremely well. Ores from the granite formation, in addition to the preceding, contain tellurium and selenium compounds; in the slate aluminium compounds and calcite, all in small quantities. Zinchlende is of common occurrence, but antimony and arsenic are not found. In the quartz deposits in the granite free coarse gold is seldom to be seen in the rock; the reverse is the case with the ledges in the slate. The sulphuret concentrations which are principally iron pyrite vary from $75 to $500 per ton. The great bulk assay $150 per ton and upward.

During the year a sulphuret reduction works known as the Auburn Chlorine Works, has been built and commenced work under the superintendence of Mr. A. Maltman. The roasting furnace used is a two-hearth reverbatory step furnace, having a working capacity of about 4,000 lbs. in 24 hours. The chlorine process is used for extracting the gold, and the residues are then treated by the hyposulphite of soda process for the silver. In the aggregate about 150 tons of sulphurets were treated, yielding in round numbers about $7,000 in gold and $1,500 in silver. The efficiency of treatment is claimed to be about 87% of assay value.

In milling facilities the district is quite deficient; there are two small five-stamp custom mills, which do fair work with rock containing coarse free gold, but which are utterly unable to work sulphureted ores, having only the most primitive apparatus for concentrating tailings. The St. Patrick or Crater Hill mill contains 15 stamps and six old style Hendy pans for concentration. It is much superior to the others noted, but is still far behind the requirements of the district. What is needed is a well constructed mill, containing very complete ore dressing or concentration plant. Before the tailings from the battery can be properly concentrated a preliminary sizing of the particles is needed, which can be secured by jiggers or similar apparatus.

(CONCLUDED.)

Notes on Mica.

[Written for the PRESS by HENRY G. HANKS, State Mineralogist.]

Mica is made a substitute for glass in certain cases where that material cannot be used, as in front of stoves, bakers' ovens, furnaces, certain lanterns, lamp chimneys, windows in ships of war, as such windows cannot be broken by the concussion of the guns. In chemistry it is sometimes used as a support for substances to be fused, and as thin covers for microscopic objects where it is desirable to have the cover thinner than can be attained by glass; it also used in the pans of the balance upon which to place powders and damp or corrosive substances to be weighed. In this case two pieces of equal size and weight are used which counterpoise each other.

Mica is also applied to ornamental purposes. In paper hangings and decorative work it is ground or otherwise separated into a fine scaly powder and sifted over the work in a kind of frosting which is made to adhere by a coating of glue size or paint. Mica of a yellow color is said to be used in the manufacture of artificial aventurine.

Mica is a Latin word, meaning a crumb or grain—little bit—morsel.

Mica salis is literally a grain of salt, but figuratively a grain of sense.

"*Nulla in tam magno est corpore mica salis.*"

The name was probably given to the mineral because it was generally found in small grains or flakes in mica schist, or mixed with the sands of streams in minute particles. There seems, however, to be a diversity of opinion, for some writers claim that the name is derived from the Latin *micare* or *mico*, words meaning to shine, glitter, flash, or gleam. The German word *glimmer*, in that language applied to mica, is derived from the same idea.

The name mica was given by Hauy, and glimmer by Werner.

Mica forms the scales in aventurine, which is vitreous quartz with spangles of gold-colored mica interspersed through it. There is a vase of aventurine in the Museum of Practical Geology, in London, bequeathed to that institution by Sir R. I. Murchison, to whom it was presented by the Emperor Nicholas I, of Russia. It measures four feet in hight and six feet in circumference. It is supported on a pedestal of polished gray porphyry. A similar vase and the only other one in the world was presented to Humboldt, and is now in the Royal Museum at Berlin.

Fine specimens of a variety of aventurine called star stone are brought from Sweden. This stone is white quartz in which small silvery scales of mica are interspersed.

Sedimentary rocks, resulting from the decomposition of the crystalline rocks, and especially granite, contain mica as one of the constituents.

There seems to be considerable doubt as to the identity of the mica in mica basalt. Dana thinks that the mineral claimed to be mica is a pseudomorph after olivine, altered by the oxidation of the iron.

The associates of mica are quartz, black tourmaline, indicolite, ruhellite, orthoclase and other feldspars, garnet, topaz, hornblende, beryl, lepidolite, cookeite, cassiterite, apodumene, amblygonite, dolomite, magnetite, siderite, pyrite, chalcopyrite, andalusite, pinite and other minerals.

The minerals which are now recognized or classed as micas may be summed up as follows: Astrophyllite, biotite, cryophyllite, lepidolite, lepidolomelane, muscovite and phlogopite. The following micaceous minerals are principally varieties of the micas, while some authors give to some of them a specific position in their works:

Alurgite, adamsite, aspidolite, cookeite, damourite, didrimite, eucamphite, epiphanite, euphyllite, hallite, helvertan, manganophylle, nacrite, odinite, phengite, paragonite, pregaratite, pterolite, pihlite, ruhellane and sericite.

According to Prof. Silliman, muscovite is the species generally found in the granitic rocks, and the phlogopites in serpentine and granular limestone.

Astrophyllite is a rare bronze-yellow or golden-yellow mica, which occurs in long narrow tabular crystals. It is a silicate of iron, manganese, magnesia, lime, soda, potash and alumina, with titanic acid and zirconium. It is a beautiful mineral but has no commercial value. Its hardness is 3, and specific gravity 3.324. Before the blowpipe it swells and fuses to a black magnetic globule. With borax, gives a strong reaction for manganese. It is decomposed by boiling hydrochloric acid with separation of silica. Its powder resembles mosaic gold. Named from its stellate crystals.

Biotite—called also hexagonal mica, and iron magnesia mica—is rather a common mineral, which has the following properties: Luster, splendent, more or less pearly; color, green to black, sometimes black, even in thinnest laminae, blood red or brown by transmitted light. It is a hydrous silicate of alumina, iron, magnesia and potash, with fluorine and titanic acid, in proportions which vary in different specimens. It is named after Biot, a French naturalist. The chemical properties resemble those of phlogopite, which will be described. Ruhellan is an altered biotite.

Cryophyllite is a fusible emerald-green mica—a silicate of alumina, potash and lithium, with other constituents in small proportions; found only at Cape Ann, Mass., in granite. It has the remarkable properties of fusing in the flame of a candle, and being decomposed by dilute acids.

Lepidolite is a lithium mica, so named by Kirwan from two Greek words meaning "scaly stone." Its luster is pearly; color, rose red to violet gray, lilac, yellowish, grayish white, white. This mica, which is not common, is a constituent of certain granites and gneiss. It has no economic value unless for the extraction of the lithium, of which it contains about 5% to 6%. Lepidolite is essentially a silicate of alumina, lithium and potash, containing also manganese and fluorine. Its hardness is 2.5 to 4 0; gravity, 2.84 to 3.0. In a closed tube it gives water and reacts for fluorine. Fuses before the blowpipe to a white or grayish glass, which is sometimes magnetic; with hydrochloric acid tinges the blowpipe flame red for a moment only.

This beautiful mineral occurs in abundance in San Bernardino county, Cal., the exact locality not yet being given. It is associated with erythrite (arseniate of cobalt) and ruhellite (red tourmaline). Specimens may be seen in the State museum.

Lepidomelana—This is an iron potash mica containing silica, alumina, sesquioxide and protoxide of iron, manganese, magnesia, lime, potash soda, and water in varying proportions. It occurs in small, six-sided tabular crystals, or in an aggregation of small scales. It is unknown in California. This mica is fusible at a high heat to a magnetic black globule. In hydrochloric acid it is decomposed with the separation of silica. Its luster is pearly to adamantine; color, generally black; sometimes green by reflected light; streak, gray green; opaque in mass, but translucent in thinnest scales; laminæ somewhat brittle. This mica is named from two Greek words implying black scale. It has no economic value. Annite, hastonite and pterolite are varieties of this mineral.

Muscovite, called also rhombic mica and hinoxide mica, is the common mica of commerce. It was named by Dana, in 1850, from "Muscovy glass," the common name, as before mentioned. It is one of the constituents of the granites, gneiss, mica schist and some of the sedimentary rocks. It is a potash mica, which plays an important part in the natural formation of soils, and is probably the source of the potash in plants and the potash minerals of the secondary formations. The constituents of muscovite are silica, alumina, protoxide and sesquioxide of iron, lime, soda, potash, water and fluorine; but the proportions are so different in different localities that no single analysis would have any value if given here. The colors also vary as much as the composition. The following variety of colors are known: White, silvery white and grayish white, rose, clear pale rose and gray ross, black and greenish black, green, emerald green, (fuchsite), faint green, brownish green, pale green, clear olive green, olive green and blackish green, brown with patches, dark brown, light brown, violet brown, smoky brown, pinchbeck brown and whitish brown, gray, violet gray and greenish gray, yellow and greenish yellow, white, brownish white and greenish white, blonde, grayish blonde and yellowish blonde, colorless, pearly, and giving a silvery reflection.

The hardness of muscovite is 2 to 2.5, specific gravity, 2.75 to 3.1. Before the blowpipe it whitens and fuses on the thinnest edges to a gray or yellow glass. With the fluxes it gives a reaction for iron, and sometimes for manganese and chromium. In a closed glass tube it gives a little water, and with Brazilwood paper the reaction for fluorine; the laminæ are very flexible, tough and elastic.

Fuchsite, named from the chemist Fuchs, is a chromium muscovite, sometimes containing as much as four per cent. of the oxide of chromium. Margarodite is a hydrous potash mica altered from muscovite by hydration, which it resembles both in crystallization and appearance.

The largest sheets of Pacific coast muscovite which have come to the notice of the State Mining Bureau are those in the museum numbered 2,160, and presented by the late Joseph Mosheimer. They are from New Mexico.

Phlogopite, or Rhombic Mica, sometimes also called magnesia mica, is a silicate of magnesia, alumina and potash, with small proportions of other constituents. A sample from Gouverneur, New York, gave to Rammelsberg the following analysis:

Silica	41.96
Alumina	13.47
Protoxide of Iron	2.12
Oxide of Manganese	.55
Magnesia	27.12
Lime	.34
Soda (trace)	———
Potash	9.37
Water	.60
Fluorine	2.93
	98.46

Phlogopite is characteristic of the serpentines and limestones. It is sometimes found in crystals of great size; one in the cabinet of W. W. Jefferis is 20 inches long, 4 inches thick at the top by 8½ inches in the center. This remarkable crystal weighs 57½ lbs.

The color of phlogopite is yellowish brown, sometimes copper-colored. In thin sheets it is translucent or transparent. The laminæ are tough and elastic. No. 1404 in the State Museum is a fine specimen of the copper-colored variety found at Burgess, Canada. The hardness of phlogopite is 2.5 to 3.0; gravity, 2.78 to 2.85. In closed tubs it gives water; before the blowpipe, turns white and fuses on the thinnest edges. It is decomposed by boiling hydrochloric acid, silica separating. This mica is seldom found in sheets large enough to be useful in the arts, and it has therefore no economic value. It is named from a Greek word meaning fire-like.

The following is a list of the mica minerals in the State Museum. The figures are the catalogue numbers:

159. Mica, Muscovite.—El Dorado county, Cal.
460. Garnets in Mica Schist.—Sitka, Alaska.
608. Lepidolite.—Middletown, Conn.
617. Muscovite.—Middletown, Conn.
738. Mica Schist.—Gold Lake, Plumas county, Cal.
1092. Mica Schist.—Ivawatt district, San Bernardino county, Cal.
1404. Copper Mica, Phlogopite.—Burgess, Canada.
1408. Mica.—Canada.
1626. Mica Schist.—Found at the ruin of Casa Grande, Pinal county, Arizona, lying on the ground in considerable quantities. Probably used in the manufacture of pottery.
1821. Mica Schist.—Philadelphia, Penn.
2031. Mica Crystal.—Paris, Maine.
2126. Jefferisite.—Susanville, Lassen county, Cal.
2160. Mica, Muscovite.—New Mexico.
2481. Muscovite Mica.—Near Tucson, Pima county, Arizona.
2953. Muscovite.—Pennsbury, Penn.
29 6. Plumose Mica, Muscovite.—Salsbury, N. H.
2980. Phlogopite.—St. Lawrence county, N. Y.
3061. Phlogopite.—Burgess, Canada.
3073. Phlogopite.—Templeton, Ottawa county, Canada.

To ascertain the price of mica in San Francisco two samples were bought at a retail stove store; one was five by six inches and the other two and one-half by five inches, and the thickness being measured with a Jackson micrometer, it was found that it would require a pile of 133 such sheets to make an inch. They were weighed, and the smaller required 119 sheets to the pound and the larger 68 sheets. The price paid for them was at the rate of $11.86 for the smaller and $13.70 for the larger. By this it will be seen how high a price the consumer is compelled to pay for this mineral in small quantities. Mr. Jacoby in his letter has given the price that the European manufacturers are willing to pay for it.

(CONCLUDED.)

A NEW GENTIAN—(Gentiana Micrncalyx.)

A New Gentian.

[Read at a recent meeting of the California Academy of Sciences, by J. G. LEMMON.]

Gentiana microcalyx, Lemmon (summit of the Chiricahua mountains, in southeastern Arizona, Sept. 30, 1881)—Comparing this plant with descriptions in Dr. Gray's late synopsis of the genus *Gentiana*, we find that it belongs in his first section, *Gentianella*, annuals having the corolla destitute of extended plaits, lobes or teeth at the sinuses; the anthers are versatile, and, at first, introrse, at length turning outward, with stigmas distinct. It falls into the second sub-section—flowers funnel-form, lobes entire, capsule sessile. Its characters are farther limited to this subdivision, with peduncles short, terminal or lateral; the stems distinctly wing-margined.

Farther than this, the plant remains undescribed. Its nearest allies have either crowns of setæ or hairs in the throat of the corolla, or their calyx-lobes are dissimilar or are conspicuously foliaceous or spathaceous; while in this gentian there are no setæ, and the calyx is regular and very small—suggesting the specific name given of *microcalyx*.

This species grows to a hight of from eight inches to two ft. The stems are quadrangular, wing-margined, branching from all the nodes in even ranks; glabrous throughout; the leaves from lanceolate to narrowly oblong, one to two inches long, the lowest shorter, all sessile and narrowed at base, three to five-nerved; calyx very small, five-cleft to the middle; the teeth lanceolate, half a line long; the tube 10-castate; flowers half an inch long, white, becoming greenish-yellow in drying; lobes four or five spreading, lanceolate, one-third to one-half the length of the tube, attenuate to a subulate point; anthers large, black, exserted; filaments long, broad and flat; capsule sessile, bursting the withering corolla; seeds numerous, small, reticulated. A strikingly beautiful white gentian, that would be a valuable acquisition to our gardens and conservatories.

In the engraving the plant is shown, cut in two parts, for the convenience of the engraver; *a*, is the calyx opened out; *b*, the flower displayed, calyx in position, corolla opened revealing the ovary; *c*, is ovary enlarged, showing the two flat, strap shaped, stigmas; *d*, the ovary, natural size; *e*, is the atamen, with its double anther, enlarged.

SAFETY APPARATUS FOR MINERS.—At a recent meeting of the Manchester Geological Society, Mr. J. S. Martin, inspector of mines, read a communication which he had received from Messrs. Forster & Fleuss, descriptive of their patent noxious gas apparatus and patent miners' safety lamp. The noxious gas apparatus comprised a knapsack arrangement by which the wearer's breath was filtered of its carbon dioxide and moisture, and after being revivified by admixture with pure oxygen, was again taken in by the lungs. It was claimed that by means of this apparatus, explorers would be enabled to penetrate safely into workings filled with gas. The lamp was a modification of the lime light, self contained and portable. The chairman suggested that the apparatus might also be useful in mills, factories and theaters in case of fire.

DIGGING the streets for mining purposes is a question that threatens to produce some excitement in the near future at Sonora, Tuolumne county.

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QUARTZ MILLS

For working gold and silver ores by wet or dry crushing. The Stetefeldt, Howell's Improved White, Brunton's & Bruckner Furnaces, for working base ores. Rotary Dryers, Stetefeldt Improved Dry Kiln Furnaces.

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Frue Ore Concentrator, or Vanner Mills.

Coarse Concentrating Works, Improved Jigs, Crushing Rollers, Sizers, Trommels, Rittenger Tables, and all other adjuncts for the proper working of Gold, Silver and Copper Ores, complete in every detail.

HALLIDIE IMPROVED ORE TRAMWAYS. We refer to Gen. Custer mine, Idaho, 5,000 feet long; Columbus Mine, Col., 4,750 feet long; Mary Murphy mine, Col., 5,000 feet long, all in constant operation.

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Improved Corliss and Plain Slide Valve Meyer's Cut-off Engines.

CORLISS ENGINES from 12x30 Cylinders to 30x60. PLAIN SLIDE VALVES from 6x10 to 36x36. BOILERS of every form, made of Pine Iron Works C. H. No. 1 Flange Iron, or Otis Steel. Workmanship the most careful. All Rivets Hand Driven.

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MANUFACTURERS OF

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HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 XX) is the Strongest Explosive Known.

No. 2 is superior to any powder of that grade.

PATENTED IN THE UNITED STATES PATENT OFFICE.

ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.

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Office, No. 230 California Street - - San Francisco, Cal.

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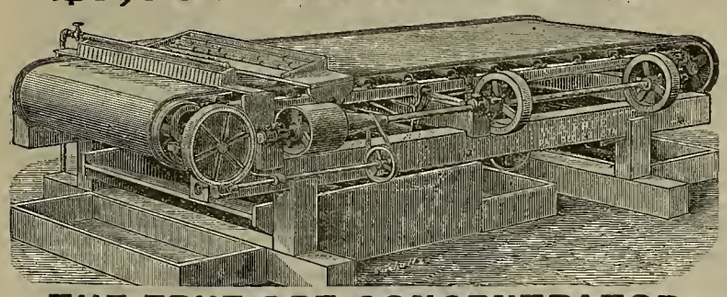

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☞A machine with all improvements can be seen in working order and ready to make tests, at the offices of Hinckley, Spiers & Hayes, 220 Fremont street.

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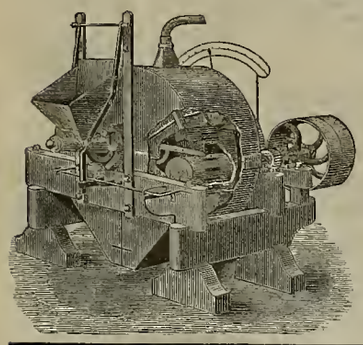

WORKS ORE WET OR DRY,

And Feeds Itself Automatically.

Patented October 11, 1881.

One of these machines can be seen at the Ore Sampling and Pulverizing works of Hofmann Bros., No 415 Mission St., where it is working every day. Weight 5,000 lbs, heaviest piece 480 lbs.

Manufactured at the

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ENGINE LATHES IN SECTIONS.

Limit of weight for 25-inch Lathes, 300 pounds. For 17-inch Lathes, 150 pounds.

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[ESTABLISHED 1860.]

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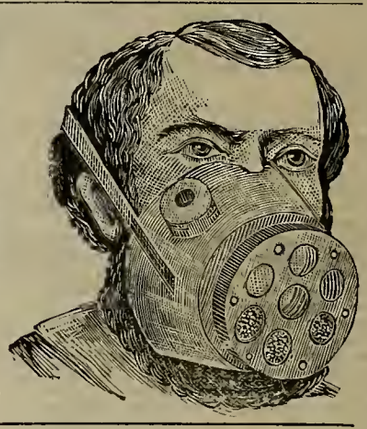
A. T. DEWEY. W. B. EWER. GEO. H. STRONG.

PATENT

LIFE-SAVING RESPIRATOR

Prevents Lead Poisoning and Salivation.



INVALUABLE to those engaged in Dry Crushing Quartz Mills, Quicksilver Mines, Guano Works, White Lead Corroding, Feeding Threshing Machines and all occupations where the surrounding atmosphere is filled with dust, obnoxious smells or poisonous vapors. The Respirators are sold subject to approval after trial, and if not satisfactory the price will be refunded. Price, $3 each, or $30 per dozen. Sent post-paid to any address upon receipt of price. Address all communications and orders to

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Or care of C. C. HARVEY,

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Send for Descriptive Circulars containing testimonials of well-known parties who are at present using them.

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—AND—

INGERSOLL ROCK DRILLS.

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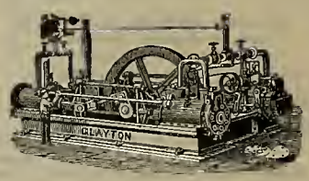

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Each grade superior to like numbers of any other Nitro-Glycerine Powder in the market.

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Superior to Black, Judson or any low grade Powder for Bank Blasts, Railroad work, or any work where Black Powder has been heretofore employed.

TRIPLE FORCE CAPS AND ALL GRADES OF FUSE.

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.
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THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand

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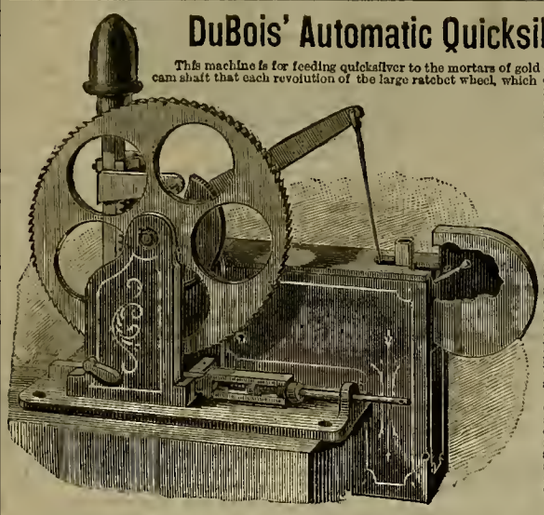
SHEET IRON PIPE.

DuBois' Automatic Quicksilver Feeder.



This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.
The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.
A chief point of excellence of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; *i. e.*, from every one to four minutes.
Price, complete, $100.

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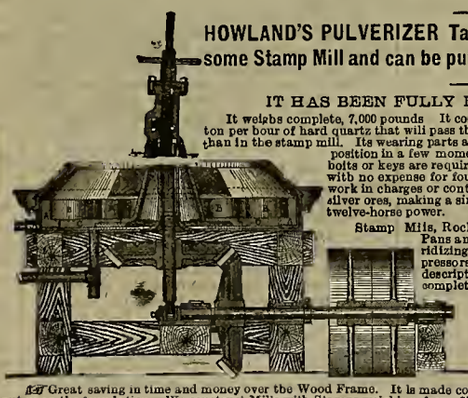
HOWLAND'S PULVERIZER Takes the Place of the Cumbersome Stamp Mill and can be put up in one day ready for work.



IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds It costs $1,500 ready for the belt Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.
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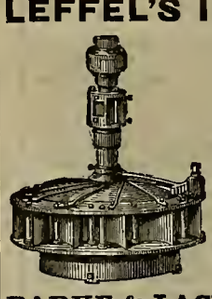

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HIGHEST PRICES PAID FOR
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ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
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Established 1856.
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Extra sizes and lengths made to order on short notice.
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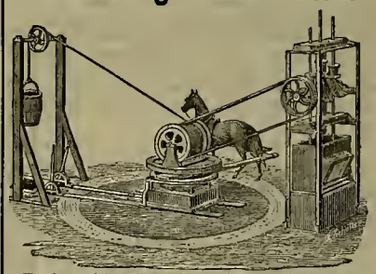

The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
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Palmer's Safety Clutch
FOR
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Will be Applied to Elevators on Short Notice.
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING FEBRUARY 7, 1882.

253,251.—BODY-BRACE—Jas. W. Anderson, Bodie, Cal.
253,258.—SCREW PROPELLER—J. Belduke, S. F.
253,349.—STORE-COUNTER SEAT—A. J. Culbertson, San Andreas, Cal.
353,267.—WATER WHEEL—R. N. Davidson, Weaverville, Cal.
253,303.—FISH HOOK EXTRACTOR—J. W. Foard, S. F.
253,255.—SEEDER AND CULTIVATOR—John E. Henris, Dixon, Cal.
253,300.—LIFTING JACK—F. Lehman, Milwaukee, Ogn.
253,314.—LATHE ATTACHMENT—Henry Richmann, S. F.
253,229.—CONCENTRATOR—J. F. Saunders, Ogden, U. T.
253,462.—ATTACHMENT FOR FURNACES—M. F. Wood, S. F.
253,186.—ORNAMENTATION OF GROUNDS—H. D. Cogswell, S. F.

FOR THE WEEK ENDING FEBRUARY 14, 1882.

253,693.—GRIPE FOR PROPELLING CARS—R. F. Bridewell, San Francisco, Cal.
253 677.—WATER CLOSET—J. Budde, S. F.
253,594.—HAIR TONIC—Lewis Forbes, S. F.
253,596.—SOFA BED AND LOUNGE—A. S. I. Gabbs, S. F.
253,620.—TREADLE POWER FOR GRINDSTONES—J. M. Nelson, Oakdale, Cal.
253,556.—PROCESS OF AND APPARATUS FOR DRYING LUMBER—Jas. Randall, S. F.
253,642.—CLASP FOR CORSET STIFFENERS—Mrs. C. V. Turner, Nicola Valley, B. C.
253,644.—FRICTION BRAKE FOR STEERING WHEELS—Walker C. Tyler, Stockton, Cal.
253,649.—EXPLODER FOR FIRING BLASTS—Alex. Watson, San Francisco, Cal.
253,650.—HAY WAGON—E. M. White, Elhi, W. T.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

CLASP FOR CORSET STIFFENERS.—Christina V. Turner, Nicola Valley, B. C., assignor of one-half to D. K. McMullen, S. F. No. 253,642. Dated Feb. 14, 1882. This invention relates to a device for fastening the whalebones or stiffeners in corsets, and for protecting the corsets from the wear of the ends of the stiffeners. It consists of a small metal clip having points, which pass through the cloth on each side of the stiffeners and are clasped behind, the top being provided with an extension for the insertion of an eyelet, and the whole device being pressed down upon and on both sides of the stiffeners. This device has for its object the holding of the stiffeners in place and the prevention of wear by means of the ends of the stiffeners being forced through the cloth.

TREADLE POWER FOR GRINDSTONES.—Joshua M. Nelson, Oakdale, Stanislaus county. Dated February 14, 1882. No. 253,620. This treadle power for grindstones consists in the combination and arrangement of parts whereby a regular and continuous motion may be imparted to the stone, securing at the same time the comfort of the operator. More particularly, it consists of a suitable frame or stand carrying a grindstone and water trough, motion being transmitted to said stone from suitable treadle levers through the intermediate mechanism of sprocket wheels or other similar devices attached to the stand.

FRICTION BRAKES FOR STEERING WHEELS.—Walker C. Tyler, Stockton. No. 253,644. Dated Feb. 14, 1882. This invention relates to steering wheels applied brakes are necessary or convenient, and the details of construction are such that the inventor can apply the brake to steering wheels already constructed. A strap encircles the wheel, and when pressure is brought to bear on a lever, the ends of the hand are brought together upon the rim. The force of this friction brake is exerted equally on the wheel. These wheels are not usually strongly journaled, so that any great side pressure would tend to injure them.

DREDGING MACHINE.—Zephaniah Williams, Oakland. No. 253,145. Dated Jan. 31, 1882. This patent covers improvements on a dredger which was patented by the same inventor in March, 1880. He adds to the dredger two vertical towers so that he can run a double set of buckets either from or to the scow, in the same direction, and thus one set can carry its work up to where the other began, and on the return swing the other can work up to the first. More work can be done with this machine. Elaborate drawings would be necessary to elucidate all the details.

HAIR TONIC.—Lewis Forbes, S. F. No. 253,594. Dated Feb. 14, 1882. This composition consists of certain peculiar ingredients combined in suitable proportions, which, applied to the head, is intended to produce and restore hair. The application is by rubbing the scalp after first carefully shaving it. This operation is continued until the desired effect is produced.

THERE were shipped from Humboldt bay last year, 59,755,396 ft. of lumber, 38,905,750 shingles, 2,918,700 shakes, and 46,145 posts.

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

Silver Ore with Cinnabar—Barcelona mine, Nye county, Nev. (See No. 2412.) W. Craig.
Silver Ore, Horn Silver—Kentucky mine, Sweetwater range of mountains, Mono county, Cal. J. S. Frost.
Cast of the Horns of the Bison Latifrons (Leidy)—Cincinnati Society of Natural History.
Unio Crassidens (Lam.)—Ohio river.
Unio Cicatricosus—Ohio river.
Unio Varicosus (Lea.)—Ohio river.
Unio Pressus (Lea.)—Ohio river.
Unio Phaseolus (Hil'd)—Ohio river.
Calcite—Nevada.
Amethyst—Lake Superior.
Pearl Spar-Dolomite—Niagara river, New York.
Cryolite—Greenland.
Lithographic Stone—Kentucky.
Quartz Crystals—Arkansas.
Red Granite—Missouri.
Copper Pyrites—Rockwood, Tenn.
White Steatite—Massachusetts.
Native Copper—Lake Superior.
Actinolite in Talc—Newfane, Vermont.
Mammillary Chalcedony (Geode)—Iowa.
Gypsum, Plumose—Kentucky.
Black Tourmaline in Quartz—Ohio.
Green Talc (Foliated) in Calcite—Ohio.
Calcite, Dog Tooth Spar—Niagara Falls, New York.
Beryl—Bolton, Mass.
Hematite—Rockwood, Tenn.
Galena Crystals—Galena, Ill.
Tourmaline in Steatite—Plymouth, New Hampshire.
Sphalerite (Zinc Blende) in Calcite, Liberty, Kentucky.
Rusophycus Bilobatus, Lower Silurian Fossil—Cincinnati Group, Ohio.
Lithostroti on Basaltiformis, Sub-Carhonifeorous Fossil—Ohio.
Columnaria Alveolata, Lower Silurian Fossil—Cincinnati Group, Madison, Indiana.
Dalmantis Linularis, Upper Silurian Fossil—Niagara Group, New York.
Monticulipora Pillasa, Lower Silurian Fossil—Cincinnati Group, Hamilton, Ohio.
Megalomus Canadense, Upper Silurian Fossil—Niagara Group, Gault, Ontario.
Endoceras Magniventrum, Lower Silurian Fossil—Cincinnati Group, Hamilton county, Ohio.
Pentamerous Ohlongus, Upper Silurian Fossil—Niagara Group, Ohio.
Gold Quartz—Mohmann mine, Big Oak Flat, Tuolumne county, Cal. A. D. Miesegaes.
Ferruginous Quartz with Gold in a Cavity Formerly Occupied by a Large Crystal of Pyrite—Modesto mine, Beveridge mining district, Inyo county, Cal. T. McDonough.
Piece of Indian Sculpture (Very Fine)—British Columbia. George Kinney.
Crystallized Mineral Containing Carhonates of Copper and Lime—It is anhydrous, and gives a white precipitate with ammonia. A full analysis will be made of it in the future. Copper Queen mine, Bisbee, Arizona. George Madeira.
Calcite Crystals—Argus mountains, Inyo county, Cal. Mrs. S. A Gale.
Spear Head of Obsidian—San Rafael, near the cemetary. G. F. Beardsley.
Country Rock with Section (Trachyte)—Rocky Bar mine, Grass Valley, Nevada county, Cal. J. D. Coughlin.
Country Rock with Section for the Microscope (Trachyte)—Rocky Bar mine, Grass Valley, Nevada county, Cal. J. D. Coughlin.
Dialogite Crystals (Very Fine)—Colorado mine No. 2, Monitor district, Alpine county, Cal. Geo. F. Beardsley.
Magnetite—Near the New England mills, Placer county, Cal. J. R. Scupham.
Cement Nodules—Glenbrook, Lake county, Cal. Found in a bluish clay covering an area of 10 acres. H. A. Aldrich.
Argentiferous Galena Showing a Radiated Structure—Brown Monster mine, Inyo county. S. D. Woodhull.
Vivianite—Brea ranch, Los Angeles county, Cal. J. W. Redway.
Nodules or Obscure Fossils—Buena Vista mountain, near Cerro Gordo, Inyo county, Cal. M. A. Wheeler. These are the same as No. 1512, which were thought to be paleozoic fossils.
Ulexite, Showing the Two Varieties—Ten tons of boracic acid has been produced from this material by the Phœnix Chemical Works at the town of Columbus, Esmeralda county, Nev. H. S. Durden.
Boracic Acid—Manufactured by the Phœnix Chemical Works, from Esmeralda county, Nev. H. S. Durden.
Calcite, Botryoidal—Cresswell ranch, Curry county, Oregon. W. B. Mason.
Chloride of Silver, Fused—Obtained from 10 lbs. of ore from the Cerro Fasco mines of Peru. William Hall.
Indian Stone Implement—San Pablo, Contra Costa county, Cal. J. Z. Davis. This was probably used in spinning. There are in the Museum six others of like form and size from different localities in the State.
Spear Head of Obsidian—Found with the last at San Pablo, Contra Costa county, Cal. J. Z. Davis.
Gold Quartz—Very rich. Keynot mine, Beveridge district, Inyo county, Cal. J. H. Holt. This specimen is peppered with fine gold which can only be seen by close inspection.
Tusk of an Elephant.-(Elephas Primigenius) Elephant Point, Behring Straits. James Wayson.
Large Specimen of Coal—Shores of Arctic Ocean. James Wayson.
Iron Ore with Fossils—Found with the last, shores of the Arctic Ocean. James Wayson.
Perfect Tusk of the Hairy Mammoth—(Elephas Primigenius). Brought from 2,000 miles up the Yukon river, Alaska. Lon Cox, Chief Engineer of the steamer *St. Paul*. This is a rare, beautiful and interesting specimen.
Chrome Iron of High Grade—From within half a mile of the town of Yreka, Siskiyou county, Cal. Dr. F. G. Hearn.
Aragonite—White and pure, Johnsville, Plumas county, Cal. W. M. Pratt. This mineral has the property of being easily reduced to a powder, and will no doubt be used as a substitute for chalk in chemical manufacture.

The Idaho's Big Pump.

A short time since we gave a detailed description of some new and heavy pumping machinery being made at the Union Iron Works, in this city, for the famous Idaho Gold mine, at Grass Valley. This machinery has now been started up, and the Grass Valley *Union* has this to say about it: For months past the Idaho Mining Co. has been preparing to set up additional pumping machinery, to relieve the strain upon the engine in use, and to provide for any contingency of an increased amount of water, should such occur; and everything now being in readiness, the new and powerful engine will be started up for regular work to-day. Up to the present time, the large engine in use has pumped all the water from the mine, different sized pumps being used, besides flat rods and V-bobs for pumping below the tenth level, which made a somewhat complicated system, and one that created the danger of the lower levels of the mine being flooded in case of a very wet winter making an extra amount of surface water to be handled. The new engine will be used in raising the water from the bottom of the mine to the tank on the 800 level, and from that point (where the surface drainage and that from the old Eureka workings is caught) will be raised to the surface by the old engine. This will give two independent pumping systems, and there will be no such strain upon the engines as to create the danger of their capacity being overtaxed.

The new engine, of which a description is given below, taken from the San Francisco MINING AND SCIENTIFIC PRESS, was manufactured at the Union Iron Works (Prescott, Scott & Co.) of that city, under the supervision of Edward Coleman, President and Superintendent of the Idaho Co. To prepare for this engine, the ground was broken last October, the excavation being made 28 ft. down to solid rock, and on this a foundation of granite, laid in Portland cement. This foundation is 63 ft. in length, 28 ft. in depth, and of a varying width of from 16 ft. to 33 ft., and firmly bolted together by 12,000 lbs. of 2¼-inch iron bolts. The cap stones on which the engine rests, amounting to 260 cubic feet, are dressed granite blocks, from the Penryn quarries. The building erected to enclose the engine as now in place is 47 ft. span by 44 ft. in length, 20-ft. posts, and supported by a truss roof. * * * *

The designs for these new improvements at the Idaho were drawn by J. V. Pitchford, master mechanic, who has superintended the erection of the same at the mine, and who is recognized as very competent, having acted in a similar capacity for several of the mining companies on the Comstock.

The expense of these new pumping works will be about $31,000, and it is expected that they will be adequate for whatever depth the mine may be worked in the future.

News in Brief.

NEW pumping works costing $31,000, have been put up in the Idaho mine in Grass Valley.

NEW YORK has never been more crowded than it is this winter. The hotel-keepers are making fortunes.

THE Northern Pacific Railroad Co. will, in the spring, have one or more light-draft powerful steamers on the Yellowstone.

THE cold weather is causing great suffering among cattle running at large in the valleys in Nevada and Idaho. A number of cattle died of thirst, the streams being all frozen.

IT is reported that the Madrone mineral springs, situated a few miles northeast of Gilroy, will be purchased by a company at Oakland for $8,000, and that $12,000 more will be spent for improvements.

HERBERT SPENCER'S meditated journey to America is now definitely fixed, he says, for August next, and he intends to be absent three months. He will visit Canada and also possibly California. He has refused all proposals to lecture, his design being solely to see the country and the people, without any ulterior object.

REPORTS from all parts of the coast of the unprecedented coldness of the weather continue to reach us. In many of the northern counties of the State the miners have been compelled to stop work, because all the water had formed to ice. Stock, cattle and sheep men also say that the cold weather has caused large losses among their stock.

MRS. C. D. SMITH, of Visalia, was scalded to death last week. She was bathing in a tub near the stove on which was sitting a kettle half-filled with boiling water. On coming from the bath she became dizzy, and to save herself from falling, clutched the boiler and pulled it from the stove, the contents completely covering her body.

INFLUX OF CHINESE.—So far this month 3,387 Chinese immigrants have arrived in this port. The *Bothwell Castle* brought 1,029 on the 2d, the *City of Rio de Janeiro* 691 on the 6th, the *Gaelic* 890 on the 9th and *Suez* 777 on the 13 h. This is an increase of 1,185 over the total arrivals during the month of January.

THERE is no abatement of the disasters that have overtaken the planters of the Mississippi valley caused by the overflow of the river between Memphis and Vicksburg. Inch by inch the river has been encroaching upon them, until now there is but a dreary watery waste, extending fully 15 miles in and from either bank.

GEN. SKOBELOFF refuses to disclaim one jot or tittle of the anti-German sentiments to which he has given utterance in his famous speech. "Yes, I did say that Germany is a common enemy, and I repeat it. I believe that safety lies in the union of the Slavs with France. The European balance of power must be re-established, or there will soon be only one power—Germany."

FORTY cords of blue gum wood have been shipped to San Quentin by A. R. Hall, of Haywards, to be worked up into chairs at the State Prison factory. This is the first experiment in this direction, and its results are awaited with much interest in Alameda county, where the gum tree grows luxuriantly in all kinds of soil. The wood was cut in the Stratton grove, planted in 1869 and 1870.

SECRETARY HUNT has received a letter from Hoffman, at St. Petersburg, respecting the relief expedition in search of the Jeannette survivors, stating that the reason why Engineer Melville was placed in command of the party was that Lieutenant Danenhower was physically unable to perform the duties of the office, as, in addition to having lost his eyesight, his terrible affliction had caused temporary aberration of mind. It is now believed Danenhower has fully recovered his reason, and his general health, as well as that of the other members of his party, is being gradually repaired.

THE Girard Co., at Tombstone, have started up their mills. Theirs is the only mill in that district working close to the mines. This makes a saving of at least $3 a ton. If this proves a success, other mills will be put up near the mines.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central system in San Francisco.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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M. P. OWEN—Santa Cruz county.
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J. W. A. WRIGHT—Merced, Tulare and Kern counties.
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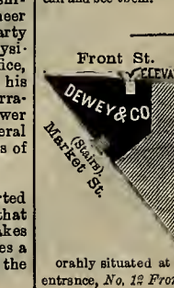

Dewey & Co.'s Patent Agency and Newspaper Offices.

Dewey & Co.'s Patent Agency and the business offices of the Mining and Scientific Press, Pacific Rural Press, Pacific Statee Watchman and the Fraternal Record are now orably situated at No. 252 Market Street. Elevator entrance, *No. 12 Front St., S. F.*

San Francisco Metal Market.

(WHOLESALE.
THURSDAY, February 23, 1881.

IRON.—		
American, Pig, soft, ton	— —	@35 00
Scotch, Pig, ton	25 50	@27 50
American White Pig, ton	— —	@ —
Oregon Pig, ton	— —	@33 00
Clipper Gap, No. 1	— —	@31 00
Clipper Gap, White	— —	@34 00
Clipper Gap Car Wheel	— —	@35 00
Refined Bar	4	@
Horse Shoes, keg	—	@ 5 50
Nail Rod	—	@ 7½
Norway, according to thickness	6½	@ 70
STEEL.—		
English Cast, lb	13	@ 15
Black Diamond, ordinary sizes	13	@ 16
Drill	15	@ 16
Flat Bar	16	@ 18
COPPER.—		
Ingot	—	@ 22
Sheet	—	@ 20
Sheating, Tinned 14x18	—	@ 31
Nails	—	@ 17
Bolts	—	@ 33
Old	—	@ —
Bar	—	@ 22
Cement, 100 fine	—	@ 15½
LEAD —		
Pig	—	@ 5
Bar	—	@ 6
Pipe	—	@ 8
Sheet	—	@ 9
Shot, discount 10% on 500 Bags		
Drop, per bag	—	@ 2 10
Buck, "	—	@ 2 30
Chilled "	—	@ 2 50
TIN PLATES.—		
10x14 I C Charcoal	7 00	@ 8 00
10x14 I C Coke	6 25	@ 6 50
Banca Tin	—	@22 50
Australian	—	@23 50
I. C. Charcoal Roofing 14x20	—	@ 6 90
ZINC.—		
By the Cask	—	@ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	—	@ 10
NAILS.—		
Assorted Sizes	4 00	@ 4 15
QUICKSILVER.—		
By the flask	@36½	36½
Flasks, new	—	@ 1 25
Flasks, old	—	@ 1 05

Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

San Francisco, Cal., February 10, 1882.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No 60, of Fifty Cents (50c) per share, was declared, payable on Wednesday, February 15th, 1882. Transfer books closed on Saturday, February 11th, 1882, at 12 o'clock M.

WM. WILLIS, Secretary.

Office—Room 29 Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

ASSESSMENT NOTICE.

Consolidated Pacific Mining Company.

ASSESSMENT, NO. 4.

Amount.....Forty Cents per share
Levied.....January 23, 1882
Delinquent.....March 3, 1882
Day of Sale.....March 27, 1882

F. E. LUTY, Secretary.

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REFERENCES—London and San Francisco Bank, S. F.; Anglo-Californian Bank, S. F.; John J. Valentine, Supt. Wells, Fargo & Co.'s Express, S. F.; J. B. Haggin, Capitalist, S. F.; Louis A. Garnett, Capitalist, S. F.; Daniel Meyer, Capitalist, S. F.; Prof. Thos. Price, M. E., S. F.; Selby Smelting Co.

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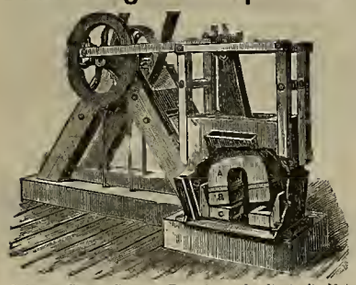

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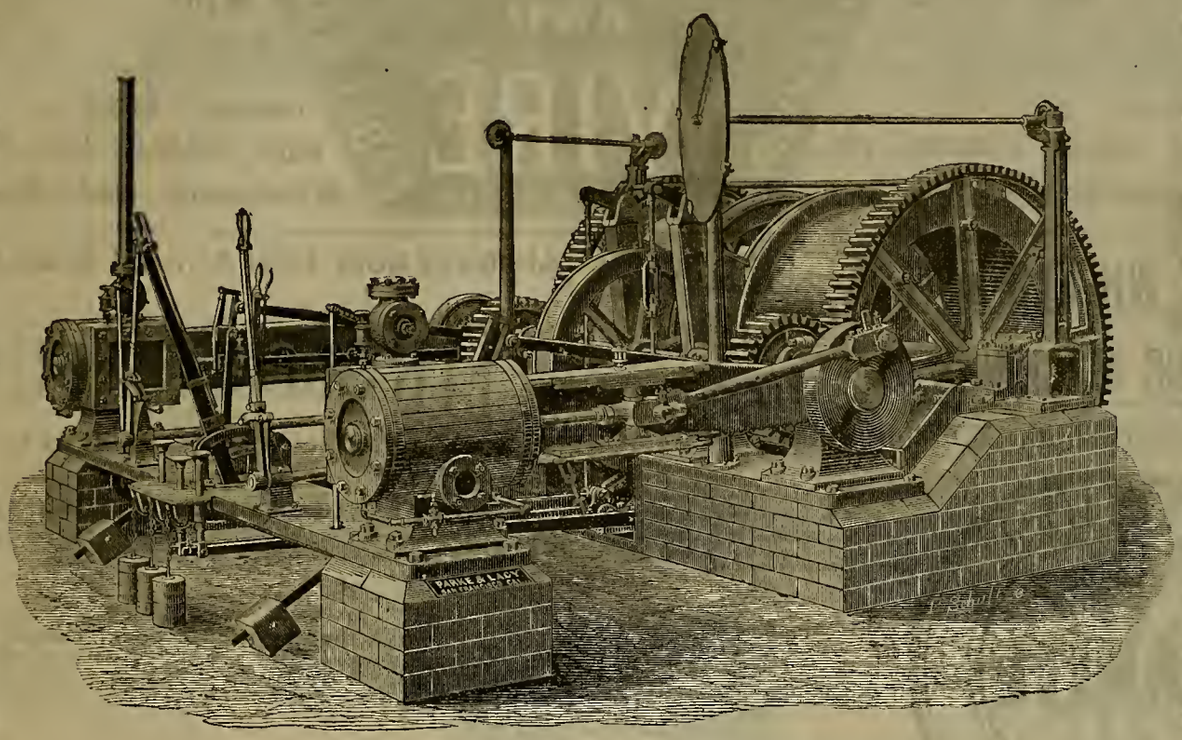

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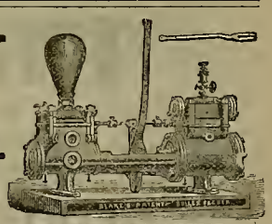

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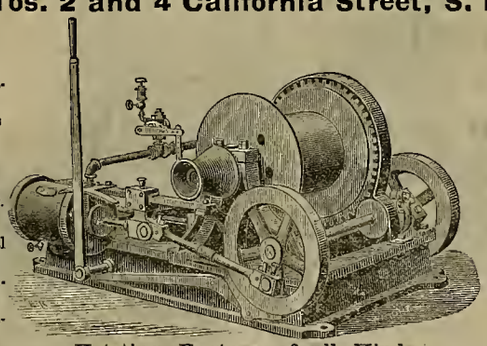

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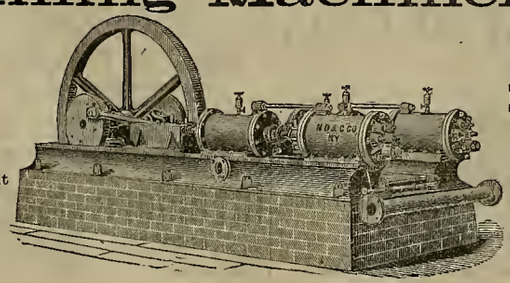

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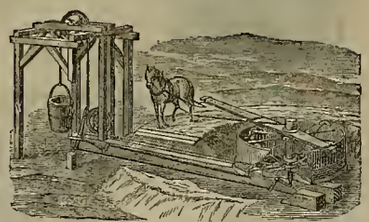

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Abstract from 19th Annual Statement of the

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CASH CAPITAL, fully paid up	$750,000
RE-INSURANCE RESERVE	306,260 52
RESERVE FOR UNADJUSTED LOSSES and all other Liabilities	55,675 77
NET SURPLUS	127,979 51
SURPLUS AS TO POLICY HOLDERS	877,979 51
INVESTED IN U. S. GOVERNMENT 4% BONDS	639,900 00
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MARCH 4, 1882.

VOLUME XLIV Number 9.

New Vertical Air Compressor.

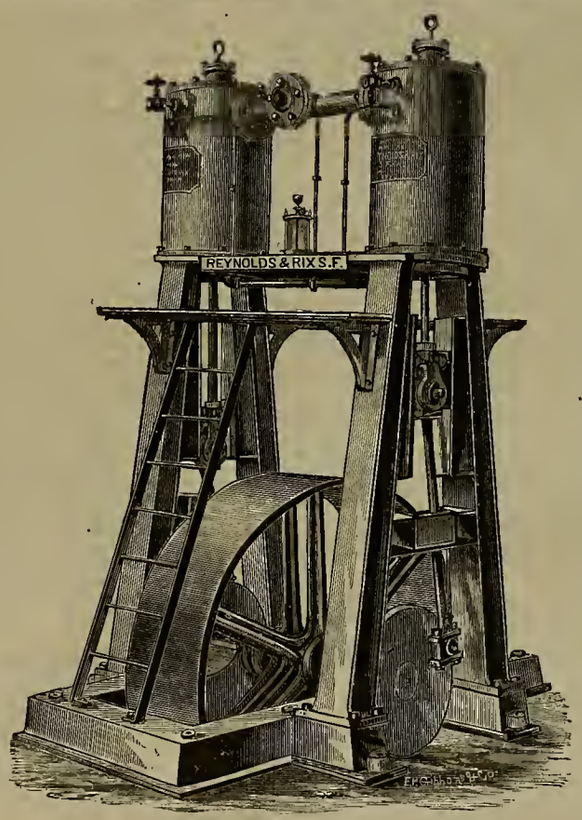
The compreseor of whioh we ehow a cnt of the style for water power on thie page, is one patented hy Edward A. Rix, through the MINING AND SCIENTIFIC PRESS Patent Agency, Dec. 7, 1880, and is mannfactured aud sold hy Meesrs. Reynolds & Rix, dealere in National rock drills, and general mining machinery. The compreesor, as ehown hy the engraving, is for water power, or to he driven hy any helt power. It is arranged with two vertioal cylinders supported on iron frames, which are eecnrely faetened onto an iron hed-plate. Theee framee are joined hoth hy a diaphragm and the platform platee, ae well ae the eduction pipes, so that they are rigidly faetened together ae well ae to the hed-plate. A etraight ehaft liee aoross the hed-platee, rnnniog in large hoxee and having large turned disks on the ende for oraoke. The connecting rode are long, thne making eaey motion on the elidee; and eteel piston rode, together with large pieton surface, make thie compreseor light running and very tight.

The peculiaritiee of the invention are in the general mode of arrangement, ae well ee speoially a new kind of sefety diecharge head, which admite of complete discharge ae well as rendering accidents to heade imposeihle ehould valvee or other enhstance get hy any chance into the cylindere. The inlet valvee are ecrewed into the pieton. All valves and jointe can he reached in a moment, and the machine ie eepecially deeigned to he a compreseor that an ordinary mechanic can keep in good rnnning order.

To each compreseor ie attached a pneumatic lnhricator, which is one of the advantages connected with ueing this machine. This lnhricator insnree a poeitive feed of oil into the cylindere, therehy rendering accident to cylindere hy cnt-ting an impoecihility.

The mannfactnrere eay: "Water ie not injected into the cylinders, consequently there ie no trouble either with complicated mechanieme connected with ench an arrangement, or difficulty with damp air and watcr, forced into enginee or drills nndergronnd hy euch machinee. A eimple water-jacket eurrounde each cylinder, which aheorhe a great proportion of the heat consequent upon compression."

Messre. Reynolde and Rix make varione eizes of these machinee and have a numher in eucceeefnl operation. Among theee may he mentioned: Two at Mullen Paee tunnel, N. P. R. R, Montana; two at Spring Valley H. G. M. Co's worke, Cherokee; one at Sierra Bnttee mine, and one at Amador Pacific mine, Plymouth. Partiee desiring to know more ahont theee machinea can eee them on exhihition at the ealeeroome of Meeers. Reynolde & Rix, 49 Fremont etreet, in thia oity.



THE RIX NEW VERTICAL AIR COMPRESSOR.

Exploder for Firing Blasts.

Alexander Watson, of thie city, hae patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, a new appliance for exploding hlaete.

This novel method of firing explooives ie adapted epecially for that clase known as high explooivee, of whioh nitro-glycerine and ite oomponnde are repreeentatives. It ooneists in the employment of a metallic cylinder having in ite lower part an anvil to receive an explooive cap, while ahove it a pieton or hammer slidee within the cylinder, being actuated hy a atont epring. The hammer has a etem or epindle, the upper end of which ie secured at the upper part of the cylinder when the hammer ie drawn np, hy any solder or composition which may he acted upon hy quickeilver. A cap acrewe down over this joint. The oap haa a drop of quioksilver placed within it and the device ie kept bottom up until needed eo that the quickeilver may not touoh the joint.

When it ia to he ueed, the cap heing placed on the nipple or anvil, the apparatne ie revereed ao that the qnicksilver may rest upon the joint, when it will attack it and looeen it, ao that the hammer may fall and explode the cap and the charge into which the cylinder ie introduced. The time ia regulated hy the amonnt of solder or cement, eo that it aote like a time fuee or mechanism.

The time of the explooion ie determined hy the amonnt of the material nsed ae a solder, and thie may he regulated eo that the explooion will occnr at the exact moment desired.

The Debris Case.

The argnment in the dehrie oaee hefore Judge Temple wae commenced at Sacramento thie week. The Court meete in the Snpreme Court room, hy coneent. George Cadwalader claimed theee pointe ae vital: First—Hydranlio mining is the exerciee of a right which prevents othere enjoying their righte, a uee of property whioh prevents othere enjoying their property; it ie, therefore, a nnieance. Second—It thne interferee with and dieturhe large numhere of citizens; it ie, therefore, a nuieance. Third—there can he no prescriptive right gained in the maintenance of a nuisance. Fourth—The Statute of Limitatione will not run aa againet a nuisanoe. Fifth—A pnhlic nnieance may he and ehould he ahated. Sixth—It ie no anewer to a charge of nuieance to say it aleo producee henefits. Seventh—The United Statee gnarantees the free uae of the navigahle etreams to the people. Eighth—The State cannot, hy law, or neglect, or permieeion, conoent to any ohstruction to enoh etreame. Hydraulic mining doee ohstruct the etreame, and prevente their free use and eojoyment. Ninth—Therefore, it ie a puhlic nuisance and ahould he ahated. Tenth—Hydraulic mining proper did not hegin till 1865, and it has not gone on without proteet. Custom is no defence, if the custom he a nuisance. Eleventh—Hydranlic mining, it is proven, ie not profitahle, hnt agriculture is profitahle, and the former ehonld not he weighted againet the latter aa heing a profitahle industry. Twelfth—A court of equity will interfere to prevent the continnance of a nuieance, and will direct and compel hydranlic miners to ceaee the depoeition of tailinge in the etreame or canyons, or ravines trihutary thereto.

The Microscopical Society.

The meeting of the San Francisco Microecopioal Society last evening was the firet under the new officere, who were choeen at the previone meeting as followe: Preeident, W. Ashhurner; Vice-Preeident, Wm. Norrie; Recording Sec'y, E. J. Wickeon; Corresponding Sec'y, C. W. Benke; Treas., Arthnr W. Hickox.

Dr. Harkneee preeented a hottle of "red enow" which he gathered last June on the Waeatch mountaine. The red enow was found on the north side of a epur which rose ahout 10,000 ft. ahove the eea level. When freeh, the snow hae the appearence of heing drenched with hlood, ae though eome large animal had heen killed. The "red snow" is caneed hy the preeence of a one-celled plant called *protococcus nivalis*, which reprodnces iteelf by euhdivision; that ie, the cell divides iteelf into eeveral new cells. Thie ie done with great rapidity, and a few celle lodged in the enow, under favorahle conditione, eoon will give it the appearance called "red enow." It wae remarked that the phenomenon of red enow had heen ohserved from the earliest timee, ae Arietotle has a paesage which ie thought to refer to it. The euhject was, however, lost sight of until hronght np hy the inveetigations of Saussure, who found it on the Alpe in 1760. He made chemical teets which ehowed him that the red color was due to the presence of vegetahle matter, which he euppoeed might be the pollen of eome plant. In 1819 an Arctic expedition under Captain Roee, hrought eome specimene from the cliffs around Baffin'e hay, and they were examined hy eminent hotaniete, eome of whom mietook the nature of the plant, and there wae long diecusoion ae to its proper classification, eome holding it to he a fungns, eome a lichen; hut it wae finally eet at reet ae one of the unicellular algæ. It is of intereet also thet eome of the early examinere prononnced the color due to animalculee, hut this wae dieproved. Dr. Harkneee said that during his last vieit to Eogland he saw the original hottle of epecimene hrought from the Arctic more than 60 yeare hefore, and in which the *protococcus* could etill he eeen with the microecope.

Henry G. Hanks, State Mineralogiet, made eome remerke concerniog the volatilization of gold, reading a communication on the euhject from E. W. Morley, of Hudeon, O. He exhihited two elidee eent by Mr. Morley, eaoh of a epecimen of the metallic glohnles, said to he gold, from the roof of the Mint at Philadelphie. Theee were examined with a two-third objective, and Prof. Hanke atated that his examination and treatment of them with acid showed conclusively that gold would hecome volatilized, and no douht pace off in the fumes from the retort.

SINCE January 1, 1881, there have arrived in San Francisco hy steamer from Hongkong 23,401 Chinese. The number each month wae ae followe: January, 553; February, 300; March, 993; April, 595; May, 2,329; June, 3,057; July, 2,072; Angust, 1,818; September, 918; October, 915; November, 2,716; December, 2,308; Jannary, 1882, 1,359; February, 3,468. In the eame time the departures of Chinese from our ehoree for their homee have heen about 8,000. This shows a net increase of this nndeeirahle population amounting to 16,000 during the time mentioned. The arrivals during the laet four monthe have averaged ahout 2,500 a month. The number in February increaeed over 70% npon thie average, although the month ie the ehorteet in the year.

THE water of the White Mountain Water Co. hegan rnnning through its pipes into Candelaria Saturday afternoon. The people are juhilant at the aeenred anceese of this gigantic enterpriee. Ite influence will he very materialy felt in Columhue mining district, the near advent of the Carson and Colorado railway aeeisting euch feeling in a great measure.

GOLD quartz haa heen struck in the Ontario claim at Stampede Gap.

THE Silver Cave mine, of Doe Cahezae, still continuee to enrpriee all who vieit the dietrict. Parties juet in from the district tell the Arizona *Star* that it ie the higgeet gold mine ever diecovered on the continent. The grade is high, and ore easily reduced.

BULLION shipmente from the Starr-Grove mine at Battle Mountain, Nevada, have been renewed.

PUMP ROD COUNTER-BALANCE.—The Union ehaft, on the Cometock, lately received a pumphoh weighing 16 tone. It will carry, when in place, 30 tona ae a counter-halance to the pumprod. The oombined weight of the halance in the eeven hohe at the Union ehaft ie 210 tone. The weight of the pnmp-rod and water eet in motion hy every atroke of the engine, is eomething over 400 tone, run at a epeed of from 3 to 10 etrokee per minnte. Four hundred tons per stroke, 2,800 tona per minute, 168,000 per hour, and 4,032,000 tone every 24 houre, ie the weight moved hy the pumping engine at the Union ehaft.

THE Richmond Con. mining Co. has just paid a quarterly dividend of $2.50 per share at London, aggregating $135,000, and making a total to date of $3,637,600, equal to $67.87½ per share. The mine adjoine the Eureka Con., which hae not paid a dividend eince laet year, and which only produced $60,000 in January.

THE January product of the Tombstone district, Arizona, is reported at $375,000, of which $121,800 ie credited to the Contention Con., $110,000 to the Tomhetone and $100,000 to the Grand Central. The Tomhetone *Nugget* of Feh. 4th eaya that the Grand Central has paid $650,000 inside of a year.

Water Jacket Smelting Furnaces.

We have illustrated and described in these columns the water jacket furnaces, both for galena and copper ores, of the types designed and manufactured in this city by Rankin, Brayton & Co., of the Pacific Iron Works. Upwards of 50 of this style of furnace are now at work in various camps on this coast with satisfactory results. In California, Idaho, New Mexico and Arizona the water jacket furnace, made ready to set up without the aid of masonry or brick work of any kind, finds ready acceptance. As compared with the old style of furnace and the relative efficiency, the cost is small. It may interest some to know from some one who has used the galena smelters how they work, and we append a statement from the Superintendent of the Castle Dome Smelting Works:

MELROSE, CAL., Feb. 18, 1882.

Messrs. Rankin, Brayton & Co., Pacific Iron Works, San Francisco, Cal.—GENTLEMEN: In reply to your application for a statement of the working of our furnaces, would say that we have two of your 40-ton galena smelters in our works that have been running most of the time for the past two years. With ordinary care I have no difficulty in keeping them in condition for constant service. The patent circulating plates, recently introduced into your water jackets, I regard as the most important improvement ever made in water jacket furnaces, and worth more than the entire cost of an ordinary jacket.

There is no question but that a jacket, for either galena or copper ores, with this improvement, will last two or three times as long as without it, besides lessening the liability to injury and the consequent expense and loss of time for repairs. Since the adoption of this improvement, I have had no trouble whatever with my jackets. The circulation of the water is so rapid that the inner surfaces of the plates are kept scoured and entirely free from any incrustation, and it seems to afford perfect protection from the effects of mineralized water, and from the overheating and burning out so common in all other jackets. Your style of sectional water jackets has many and obvious advantages over all other forms. The distribution of the blast and the angle of the tuyeres are such as are calculated to secure perfect combustion and the greatest economy of fuel.

With a long and varied experience in smelting ores from a wide range of mineral country, I unhesitatingly give your furnaces the preference over any I have ever seen. The machinery comprising the smelting plants furnished by your firm I regard as admirably suited to that purpose—complete in detail and adapted to all the requirements of practical work. The improvements you have made in this class of mechinery are recognized as of great value to the mining interests of the country, and make smelting, under ordinary conditions, the cheapest form of reduction for any ores that can be worked by this process. Yours truly,

W. P. MILLER, Supt.

Wealth Produced by Hydraulic Mines.

L. L. Robinson, Vice-President of the Hydraulic Miners' Association, testified in the Gold Run case that the stockholders in the hydraulic mines have paid out thus far the enormous sum of $7,600,000, and have received in dividends but the paltry sum of $1,350,000, making a loss of $6,250,000. Where, then, is "the wealth produced by the hydraulic mines?"—*Sacramento Bee.*

The *Bee* is very funny when it argues about hydraulic mines. It talks like the stockholders of those mines had dumped $7,600,000 into a hole in the ground and covered it up. On the contrary the truth is that that same $7,600,000 is now in existence and is circulating around the world, doing good to commerce and manufacturing. The money was paid by those holders of hydraulic mines to workingmen, and the money went to support happy families. Then, while the $7,600,000 are still in the world, the works that that money put in operation have brought into circulation $1,350,000 as dividends, and about as much more for running expenses. We have then the $7,600,000 still in the world, and that operated to bring, say $2,700,000 worth of coin into the world. That is wealth produced by the hydraulic mines. The world is getting more benefit than the owners have yet realized from that class of mines, but still the wealth produced will buy a great many potatoes.—*Nevada Transcript.*

WARNING TO WHEAT EATERS.—"How is it," asked a reporter of a Stockton paper of a prominent wheat buyer, "that you wheat men always spit out the grain you sample?" "That is easy enough to explain," said the man of cereal proclivities. "Do you know that many a man has ruined his constitution, and in lots of instances consumption has been brought on by acquiring the habit of eating wheat? The reason is this, the husk of the wheat somehow or other finds its way into or affects the lungs. In Mark Lane it is the custom to fine any man found eating wheat one shilling." This will be received as news by the general public.—*Sac. Bee.*

THE enormous quantity of $1,000,000 worth of blasting powder was used in Colorado during the past year.

White Mountain District.

A Little-Known Region in Inyo County.

A correspondent of the Inyo *Independent*, writing from the above locality, says: If you can find space in your valuable paper, I desire to lay before your many readers a few facts in regard to a mineral zone or belt, of which little, if anything, is known among the mining men of the Pacific coast. I do not make pretention of being a mining expert or newspaper writer, but simply state what I know to be facts, and what anyone can see by visiting the country. Many of your readers are engaged, more or less, in mines and working minerals, and ores of every kind in which this county abounds. But such interests in this county are only in their infancy. There is more precious metal to be found on the surface in this county than any other to be found on this side of the Rocky mountains. If the White mountains could be placed just as they are to-day in New Mexico or in Arizona, there would be a general stampede for the county. The newspapers would have a boom, and millions of money would be made in less than two years. Music sounds the best afar off, when heard.

Now, about this mineral zone or belt of argentiferous galena ore. It is situated on the eastern slope of the White mountains, about four miles southeast of the summit, facing Deep Spring valley and about seven miles west, up Wyman creek; Crooked creek at the north, and Birch creek south. It is about five miles in length, and three-fourths miles wide. The formation is lime and slate. We will start above the old stone cabin on Crooked creek and follow the main mother ledge of this belt. Where we strike the outcrop of this mammoth lode is about one-fourth mile south of the creek, on a small round hill of solid formation. We find a shaft sunk on the vein some 14 or 15 ft., and from 20 to 30 tons of first-class smelting ore on the dump, chlorides, carbonates and galena; vein four ft. between walls; the ledge crops out about 300 ft. Here we cross a dry ravine and shortly we find another shaft down 42 ft., and about 40 to 50 tons of ore on the dump. The vein is about 2½ ft., of splendid ore. I was told the average of this ore, as it comes from the bottom of the shaft, assays $89.58 in silver, $21.30 in gold, and 48% lead. This is also located in a permanent hill, and has slate foot and lime hanging walls.

This mine is situated on the north side of Coalburner's canyon. About 200 yards above, west and up this canyon, is a valuable spring of fine water, which runs some six inches in the dryest season. I was also told that this spring was claimed by the mine owners. This I consider a fine property. Here we leave Coalburner's canyon and go south, following the main belt to Wyman creek. On our way we find three locations that look well, all showing more or less mineral, and of good grade. On this main fissure vein, which extends through this belt from Wyman creek to Birch creek south, there are 35 locations made, all showing veins from 12 inches of solid metal up to 6 ft. of fine chlorides, carbonates and galena ores. To describe this section, and why this country has been kept in the background, is what I propose to show to your readers. To do so in this letter will take up too much space. Next week I will give you a slight idea of the country from Wyman creek to Deer creek, and from there to Birch, where all of the most valuable mines are situated.

TOHONGO MINES.—Capt. L. Haight, Superintendent of the Tohongo mines made a pleasant call recently at the *Commercial* office. He reports the mines in his district in a prosperous condition, and the mine he is superintending having a four-foot vein of ore that averages $25 per ton and has yielded $40 per ton by the arastra reduction, and some assays have run as high as $200 per ton. The company is composed of San Francisco capitalists, and over $20,000 have been expended in prospecting and on the mill, which is Haight's improved Chile mill and is equal to about 10 stamps. In about a month the mill will be in running order and then we may expect a mining boom in Los Angeles county. The mines of this company are situated about 20 miles southwest of Ravenna Station on the S. P. R. R. and in the north side of the Sierra Madre mountains near the headwaters of the little Tujunga creek. A good wagon road has been made to these mines mostly over the mountains. Captain Haight thinks a good wagon road could be constructed from Los Angeles to the mines, with 30 miles of smooth track and but 10 of mountain road. This road would open up a large mining camp to the trade of this city, and could be made at a small expense. There are other mines in the vicinity that would be tributary to this road and make a lively trade with this city.—*Los Angeles Commercial.*

LUDWIG & CARTER COPPER MINE.—The smelter is now turning out a little over 100 lbs. of copper every half hour, which, for its size, is considered pretty good work. A large iron water tank has arrived and will take the place of the smaller one heretofore used. Mr. Jones, the smelter, has proven his water-jacket invention a success. It does away with the use of fire-bricks and obviates the necessity of stoppages every few days to replace them. Last week a car-load of copper bullion was shipped to San Francisco. Copper having advanced to 23 cents, the owners of the Ludwig & Carter ought to realize a handsome fortune from their mine.—*Esmeralda Herald.*

What Developments on Silver Hill Show.

The developments on Silver Hill in the Cortez, Utah and Centennial mines, which are located towards the lower portion of the northwest side of the hill, goes to prove beyond a doubt that there are very large bodies of ore in the larger veins higher up on the hill. The Cortez's lower tunnel taps their ledge over four hundred ft. below the surface, where they find it stronger than on any other level in the mine, and carrying as rich ore as at any other point, which gives them four hundred ft. to stope between their tunnel level and surface. Just imagine how much ore there must be in the Silver Hill Consolidated, or the old Esmeralda, which is the highest ledge in the district between the surface and the level of the Cortez tunnel, the difference in elevation being about 800 ft., and the ore in the Esmeralda from the top of the ledge, which stands 70 ft. above the surface of the summit of Silver Hill, as deep down as the chute has been prospected assaye for a thickness of three or four ft. nearly $500 per ton. Should the ore continue down, which we have every reason to believe it will, as the vein is nearly ten times the thickness of the Cortez on the surface and stands up almost vertical, while the latter dips at about sixty degrees, what an immense thing it will be. And between the Cortez and Esmeralda there ie the Silver Hill Consolidated, which was formerly the Excelsior, with a very strong ledge having one of the best hanging walls in the district, and very fine looking ore in the ledge, the Seminole and many others which look very favorable as far as work has been prosecuted; and if the theory advanced by W. P. McIntosh in his communication in this issue is correct, and we have no reason to doubt it, as he has given a great deal of attention to the study of the formation of this district for the past four years, Silver Hill can turn out enough money to pay the national debt.—*Esmeralda Herald.*

The Sandias—Past and Present.

The Sandia mountains are dotted with ruins of ancient smeltere of a kind that are not in use anywhere at the present day. The native New Mexican or Spanish people do not appear to have acquired the mode of erecting them from the Indians. Even the Pueblo of to-day seems to be ignorant of the manner of their construction. They were cheap and simple, but they answered the purpose admirably. But in no instance has any indication of the existence of a stamp-mill been found in the Sandias. This would show that ancient mining was not restricted to the working of free gold, and that the extraction of gold from smelting ore was understood. But it is undeniable that discoveries in the modes of obtaining gold from combinations of ores have recently been made that could never have been known to the ancients, and this is proven by the fact that much of the slag now found near these old smelters contains gold in considerable quantities. Yet the records, histories and traditions agree that gold was obtained in fabulous amounts. With modern appliances and new and cheap methods, the yield should now be much greater. Gold ore in whatever shape can now be cheaply treated and not an atom be lost. When one takes into consideration the great bulk of gold taken out of the Sandias by the Indians in their crude way, he must be convinced of the wonderful richness of these mountains. There is every reason to believe that the Sandias will eventually be regarded as the greatest of all New Mexican mining districts.—*Bernalillo News.*

Another Montana Boom.

The Bismarck *Tribune* of the 20th ult. has a flaming account of Maidenville and the mines around Fort Maginnie. Its information probably came from a prospector who "got a job" the day he "struck town." If he had remained without work 48 hours he would doubtless have given the town a black eye, after the manner of some recent Butte experts.

The *Tribune* says: The chances are becoming numerous that the new silver mining region in the vicinity of Fort Maginnis, M. T., will attract a big stampede in the spring. Five miners and prospectors, the discoverers and early pioneers of that camp, who have been East, arrived here last evening on their return. During a conversation with one of the number, we learned that the new mines are located about six miles from Maginnis, in the Judith basin, in the Snowy mountains, between the Yellowstone and Missouri rivers.

The first silver ore was struck last May, and now there are over 2,000 inhabitants in that section, many of whom are from the Black Hills. The largest town there is called Maidenville. It is the opinion of our informant that the mines on this belt will prove the richest ever discovered in Montana.—*Inter-Mountain.*

BORACIC ACID WORKS.—R. E. Doran's teams are now engaged on a contract to haul 100 tons of "cotton balls" from the old Columbus borax marsh to the Phœnix chemical works at Columbus, owned by Wm. M. Purdy. There are a number of Chinamen employed at the marsh gathering the borax "cotton balls." The work, though small, are a decided success, preparing the raw material to a fineness of 95% for shipment.—*Esmeralda Herald.*

ARIZONA, it is estimated, will output 15,000,000 lbs. of copper during the present year.

Richness of Cochise County, Arizona.

The Tombstone *Epitaph* says: In looking over the mining field, not alone of Tombstone, but the entire county, we see nothing but the most hopeful signs for the future. At home, new claims are being brought to a state upon the border line between prospects and mines, where, by the judicious investment of comparatively small capital they would, in most cases, become paying properties. Bisbee, the great copper camp of Arizona, is in a similar condition. There are a score or more of the most inviting copper locations in that camp that give unmistakable indications of large deposits of ore similar in nature to that of the celebrated Copper Queen mine. In the Huachucas, developments are steadily progressing upon several properties that give strong evidence of soon becoming large producers of both copper and silver. Reports from the newly discovered mines in Winchester district are most hopeful. The property purchased by H. Solomon and George Hearst is opening out quite as rich as they expected when they made the purchase.

Other claims in the same vicinity are also showing rich ore, which gives the owners faith that they are upon the verge of bonanzas equal to anything in the Territory. Dos Cabezas is also looming into unwonted prominence, and we hear of sales being negotiated at remunerative prices to the locators. This is the gold district, par excellence, of Arizona. The ledges are described as large and well defined, with the gold evenly disseminated throughout the vein matter. It is believed by those who have cast their lot in that locality that the day is not distant when Dos Cabezas will take rank with the most favored districts in the land. We also hear good news from the mines in the Chiricahua mountains—at Galeyville and Ayre camp. The Texas smelter has of late been doing good work, and Col. Clute feels perfectly satisfied that when their smelter shall be in operation he will turn out a continuous stream of bullion, to gladden the hearts of the owners.

Returning toward home again, we strike the mines in the Dragoons, which show remarkably well for the work done upon them. In the Turquois portion of the Dragoons this is particularly the case. Upon the western slope there is a force of men taking out ore from the Silver Cloud and also from the Royal Arch mines, which is of high grade.

That Cochise county is one of the richest pieces of territory within the borders of the United States is a perfectly safe statement to make, and that were one-half its resources developed we would be reminded of the palmy days of Washoe, when one-half the people were crazy with the argentiferous wealth of the Comstock.

Heat in Silver Mines.

If there is to be found anywhere in the world, says the Virginia *Enterprise*, a set of human salamandere, we may claim the credit of having them on the Comstock. What would scorch men who live wholly on the surface, chills the miners who are inured to the lower levels. A miner who has been for some months past working in one of the hottest sections of the Comstock, a day or two since gave an *Enterprise* reporter his experience of the heat which miners are often called upon to encounter. He says that in working at points where the thermometer marks a temperature of 115 to 120 degrees great thirst is experienced. No ice-water is too cold to be swallowed with a relish. Men go to the water-barrel, in which huge chunks of ice are floating about, and will take their picks and chop up the ice in order that the water may be rendered cooler by being filled with small fragments. Often this does not satisfy them, and they chew up and swallow lumps of ice. The natural temperature of the human body is about 97°, Fahrenheit. Therefore, when a man remains in a hot place for an hour, or even half an hour, his blood and even his whole body becomes heated to a temperature of 115°, 120°, or whatever the temperature of the place where he is at work may be. It is then that the miners begin to pour down ice-water and to eat ice. The strangest thing about the business is that it does not hurt any of the men. Often they swallow such quantities of ice-water that their stomachs will not retain it, and in vomiting it up it will feel cold in their mouths and against their teeth. All they do on such occasions is to swallow some more, but more cautiously.

THE earliest attempt to obtain light by incandescence in a vacuum was made by King in 1843, who applied continuous metallic and carbon conductors and heated them by the electric current in a Torricellian vacuum. He was followed, in 1848, by Staite, who used an iridium or an iridium and platinum wire, and enveloped the holder in glass or some other non-conductor. In 1872 Konn employed graphite and rendered it incandescent in an atmosphere of nitrogen, in which there was no wasting away of the carbon. The same principles have been followed, but with greater promise of success, in the more recent attempts of Edison, Maxim and Swan at producing illumination by means of incandescence.

INCREASED mining excitement is observable all through the New Mexican mining camps, and mining machinery and supplies are crowding all the thoroughfares leading to them.

MECHANICAL PROGRESS.

The Circular Saw.

In Europe the circular saws are made considerably thinner than in the United States. Much more skill is necessary in hotb the manufacture and use of suob saws than in the tool as employed in thia country. Our mechanics, however, are sufficiently skillful to uso the thinner saw whenever they find economy in so doing, or whenever the manufacturers meet with a demand for the change. The scarcity of timber in Europe is an objection to the greater wastage attendant upon the uso of the thiok saw. The *Northwestern Miller* says that hitherto the thick circular has proved a rapid and cheap servant, giving a maximum duty with a minimum of cost, both for repairs and attendant labor, in the past days of a bountiful supply and corresponding cheapness of product, and a mere change of saw thickness hardly seems sufficient cause to seriously impair its position. It is to be remembered, however, that considerable difficulty has been encountered by those who, foreseeing the demand for thin circulars, have experimented in their manufacture.

The fact seems to be that in every part of the manufacture greater skill is requisite. Thus the straightening, the regulation of the degree of tension, the balancing and the hanging, require more careful manipulation. In the use the speed must be kept more regular, the belt must be kept more tant, heating must be more carefully avoided, and the set and truth of the teeth more rigidly maintained. In addition to these requirements, there are, however, some that pertain to the machine itself; thus, the spindle and collars must be more rigid and free from vibration, lost motion or play in the parts, while all the adjustments will require to be more accurately made. All these requirements, however, will be successfully met and supplied just as soon as the saw user calls upon the manufacturer and the mechanic to supply them.

LINKS.—To close a quadrant or link that has sprung or opened in hardening, clamp it with bolts and plates, placing the die in the slot to support any part which does not require to be closed. To open the slot of a quadrant or link that has closed in being hardened, take two keys having an equal amount of taper upon them, and place them together so that their outside edges are parallel. Insert them in that part of the slot which requires to be opened, and, holding a hammer against the head of one key on one side of the link, drive in the other key with a hammer on the other side of the link. After the key is driven as far in as the judgment suggests, measure the width of the slot, so that, if the operation was not performed to a sufficient extent on the first attempt, the operator may judge how much to essay at the second, and so on. To prevent, as far as possible, a slot link or quadrant from altering its shape in the process of hardening, fit into the slot, at various parts along its length, pieces of iron of the same diameter as the die intended to work in the slot, and in quenching the quadrant, immerse it endwise and vertically.

BRASS WORKERS' DANGERS.—Every man who works on brass to any extent must have noticed how his system becomes so permeated by the dust arising from it that all the secretions, salivary and the perspiration, become vitiated by it. This is so grievous that brass workers' shirts in summer time are stained green, and green perspiration exudes from the pores of the skin and stands in beads upon it. The expectoration from the throat is of the same color; and cuts or wounds upon the fingers are very sore, much inflamed, and slow to heal. The average machinist greatly dislikes a prolonged job of brass work. For ourselves, we cannot speak positively of physical discomfort, pains and ailments arising from working on brass, but judging from the lack-lustre eyes, sallow skins, emaciated appearance and general enervation of many brass-workers, we judge that they must suffer much distress. The source of the trouble is from the copper and lead in the brass, principally the copper, for of the latter metal, except in soft yellow brass, there is very little.—*The Mechanical Engineer.*

AMERICAN RAILROAD CARS FOR EUROPE.—As an evidence of the constantly increasing popularity of American made and American style cars abroad, we may state that the Pullman company are now building at their Detroit shops two compartment sleepers and two hotel cars, for the Midland railway of England, and two compartment sleepers for a French road. All these cars will be finished in mahogany, and will be shipped in sections ready to be set up immediately on their arrival at their destination. The hotel cars will have seat arms that drop at the end of the seat as a convenience to passengers in taking seats when the tables are in place. The designs of all the cars are original and in every sense American, and reflect much credit upon the construction department of the Pullman company.

AMERICAN MACHINERY ABROAD.—A gentleman recently from Central America and Mexico, states that there is a general stampede in those countries for American machinery of all kinds, and that European builders are making frantic efforts to retain the trade by depreciating the worth of American-built machines.

The Mechanics of Forty Years.

The contrast between the machine shop of forty years ago and of to-day has some salient points that may interest the present generation of journeymen. There has been no great and sudden change between methods and means of forty years ago and those of to-day, but a gradual improvement that can be readily traced by the workman of to-day who remembers his apprenticeship.

Forty years ago there was no solid iron bed lathe; the best lathes were built on "ways" of southern pine, into which were seated short sections of cast iron to form the seats and ways for heads and carriage. These were seated by means of grooves cut by hand planing, and held in place by wood screws, passing through the casting into the solid yellow pine, almost as hard and enduring as the iron. These ways were shipped and filed to level and then *planed by hand*, an ordinary jack plane being used to smooth the inequalities of the iron and insure an even length. A block of wood grooved to the "ways" was used to finish them by means of emery and oil, and lastly by water and molding sand. Now this looks like boys' play in the light of our admirable systems of planing, finishing, scraping and testing. But some very excellent work was done in the building of tools by these crude methods; and the tools themselves did satisfactory duty for years.

The first planer for iron was similar to that now in use, except for its improvements. Midway of a long table rose the "head," and this held a cross-screw, turned by a wrench and a down-feed screw, also hand-managed. Of course, there was no automatic down-feed or cross-feed. At each end of the frame of heavy yellow pine timbers, reinforced with a rib of iron with a V section, was a roller of timber some ten or twelve inches in diameter, and this was driven by a belt one-half the time of operation, and a similar one at the other end was driven at alternate half times. Each of these wooden rollers engaged with and "took up" a heavy log chain that was connected with the platen.

This was the original planer for iron, and crude although it was, it did excellent work for many years. To be sure, there was a jerk and hesitation about the return, after the chip had been taken, and a sort of deliberation about engaging with the next chip; but when it started it went like a vexed yoke of unused steers, and made things rip.

The lathe was scarcely better as regarded usefulness and exactness. It was a much older tool, but it had never been improved. The cone pulleys of the head *must* be of mahogany or of other close-grained wood, and must also be scored "to hold the belt." The first daring tool builders who cast, of iron, the graded pulleys of a lathe head found all the machinist world against them. It was certain that no belt could hold on a polished iron surface. It was settled that wood was the only proper material for the pulleys of a lathe. At that time—40 years ago—it would have been ridiculed, if it was stated that a continuous screw should be used as feed movement on lathes of more than six feet, and yet all our lathes now are screw feed, no matter what their length. There are establishments which would contract to furnish screws of any reasonable length, from 10 to 50—or more—feet, and engage that the graduation of the thread should not get out of gauge appreciably in that total length.

In an article noticing these improvements, it would be improper to claim that all the present condition and all the past improvement is to be credited to our present race and run of mechanics. We of to-day inherit and use the chances and improvements of those who have gone before. The trials of skill against unmovable matter count for something. We of this later day *do* what our fathers suggested as possible and dared not attempt—or, more likely, had not the encouragement to try.

To-day the workmen—the mechanics of the country—have appliances to do and encouragements to attempt, which were altogether lacking 40 years ago. A machine shop of to-day is a finely finished and furnished dwelling as compared with an uncouth log cabin of half a century ago. The mechanic can use material and appliances which were scarce or costly 40 years ago and his work is as much better than that of 40 years ago as the house is better than the log cabin. But beyond this coarse comparison, it is true to-day as it was 40 years ago, that the real mechanic can do work with insufficient tools, if required, or can create means where the demand is made.—*Boston Journal of Commerce.*

THICKNESS OF LINERS.—To ascertain the proper thickness of a liner or strip necessary to go between a pair of brasses so that (when the faces do not meet) the liner may be placed between them and the brasses, when bolted up tight, without jamming the journal, place a piece of lead wire between the brasses, and then screw the cap down tight, and the lead wire will compress, denoting the necessary thickness of liner. The latter should be made a shade thicker than the distance the wire was compressed, so that the brasses may fit without binding the journal.

QUITE a number of Comstock miners are making arrangements to go out along the line of the Carson & Colorado railroad this spring, as soon as the weather becomes settled, for the purpose of prospecting and working in mines already located.

SCIENTIFIC PROGRESS.

The Origin of Our Moon.

Prof. Robert S. Ball, a somewhat distinguished English scientist delivered a lecture, recently in which he incidentally alluded to the probable formation of our moon in the following terms:

Let us leave the earth for a few minutes, and examine the past history of the moon. We have seen the moon revolves around the earth in an ever-widening orbit, and consequently the moon must in ancient times have been nearer the earth than it is now. No doubt the change is slow. There is not much difference between the orbit of the moon a thousand years ago and the orbit in which the moon is now moving.

But when we rise to millions of years the difference becomes very appreciable. Thirty or forty millions of years ago the moon was much closer to the earth than it is at present; very possibly the moon was then only half its present distance. We must, however, look still earlier, to a certain epoch not less than fifty millions of years ago. At that epoch the moon must have been so close to the earth that the two bodies were almost touching.

Everybody knows that the moon revolves now around the earth in a period of 27 days. The period depends upon the distance between the earth and the moon. The time and the distance are connected together by one of Kepler's celebrated laws, so that, as the distance shortens, so must the time of revolution shorten. In earlier times the month must have been shorter than our present month. Some millions of years ago the moon completed its journey in a week instead of taking 28 days, as at present. Looking back earlier still, we find the month has dwindled down to a day, then to a few hours, until at that wondrous epoch when the moon was almost touching the earth, the moon spun round the earth once every three hours.

We have hitherto been guided by the unerring light of dynamics, but at this momentous epoch dynamics desert us, and we have only probability to guide our faltering steps. One hint, however, dynamics does give. It reminds us that a rotation once in three hours is very close to the quickest rotation which the earth could have without falling to pieces. As the earth was thus predisposed to rupture, it is of extreme interest to observe that a cause tending to precipitate such a rupture was then ready to hand. It seems not unlikely that we are indebted to the sun as the occasion by which the moon was fractured off from the earth and assumed the dignity of an independent body. It must be remembered that the sun produces tides in the earth as well as the moon, but the solar tides are so small compared with the lunar tides, that we have hitherto been enabled to neglect them. There could, however, have been no lunar tides before the moon existed, and consequently in the early ages before the moon was detached the earth was disturbed by the solar tides, and by the solar tides alone.

The primæval earth thus rose and fell under the tidal action of the sun. Probably there were no oceans then on the earth; but tides do not require oceans, or even water, for their operation. The primitive tides were manifest as throbs in the actual body of the earth itself, which was then in a more or less fluid condition.

At the remote epoch of which we are speaking the solar tides were very small, as they are at present. Yet, small as they are, there was a particular circumstance which may have enormously increased their importance. The point to which I refer can be illustrated very simply. We have here a weight of 14 lbs. freely suspended, and here I have a small wooden mallet which barely weighs half an ounce, yet small as this mallet is, I can make the heavy weight swing by merely giving it blows with the mallet. Let me try. I give the weight blow after blow. I hit it as hard as I can, yet the weight hardly swings. I have not yet been successful. The art of succeeding is merely to time the blows properly; this I am now doing, and you see the weight swinga in an arc which is steadily augmenting.

We therefore see that a succession of impulses, in themselves small, can yet produce a great effect when they are properly timed. In the present case the impulses should succeed each other at the same interval as this pendulum requires for one two-and-fro oscillation. The time therefore depends on the body struck, and not at all on the body which gives the impulses.

Just as this pendulum swings with a definite period so the vibrations of the primæval earth had a certain period appropriate to them. Suppose that the liquid primæval globe were pressed in on two quadrants and drawn out on the two others, and that the pressures were then released. The globe would attempt to regain its original form, but this it could not do at once, any more than the pendulum can at once regain its vertical position; the protruded portions would go in, but they would overshoot the mark, and the globe would thus oscillate to and fro. Now it has been shown that the period of such oscillations in our primitive globe is about an hour and a half, or very closely to a half the supposed length of the day at that time. The solar tides, however, also have a period half the length of the day. Here then we have a case precisely analogous to the 14 lb. weight I have just experimented on. We have a succession of small impulses given which are timed to harmonize with the natural vibrations. Just as the small timed impulses raised a large vibration in the weight, so the small solar tides on the earth threw the earth into a large vibration. At first these vibrations were small, but at each succeeding impulse the amplitude was augmented, until at length the cohesion of the molten matter could no longer resist; a separation took place: one portion consolidated to form our present earth; the other portion consolidated to form the moon.

The Wonders of the Spectroscope.

This little instrument combines with its qualities of a trap the advantages of a balance, which we may suppose is fine enough for the most fastidious fairy to weigh the nectar distilled in the dew-drop, or other delicacy of the season.

Our ideas of weight and size are purely relative, and that which seems a small or light object from one point of view may become large and heavy by a different comparison. To most of us, perhaps, a "grain-weight" suggests a little thing; we know that the apothecary and a few other small dealers split up the grain into halves, quarters, tenths and, perhaps, even hundredths, but then we regard them as homeopathic visionaries and laugh at their absurd little pellets; yet, strange to say, there is a vanishing-point in our minds, which, if an object is small enough to pass, it becomes larger and more important by reason of our astonishment and wonder at its minuteness. The most ordinary specimen under the microscope is an evidence of this, but when we realize that the ability of the spectroscope to reveal small particles of matter begins where the finest microscope searches with its highest power in vain, that the grain of matter may be divided, not merely into hundredths, thousandths or tens of thousandths, but into millionths and tens of millionths, and that a single one of these particles may be readily detected by this little searcher and held up for inspection, our wonder and amazement enhance our respect for its occult powers. The astronomer tells us that a comet often throws out a tail longer than the distance between the earth and the sun, and broad in proportion; yet the matter forming this tail is so attenuated that, if properly compressed, a gentleman's portmanteau, possibly his snuff-box, might take it in. Yet we have merely to point this little tell-tale at the comet, and, presto! we know what the matter is. Think of it! Not merely can we grasp infinitesimal particles at our hand, but we may sweep the firmament, gather up the star-dust and tell its composition. But we have not yet reached the end of our excursion; indeed, we have only entered the threshold of the scientist's sanctum, and the wonders of the arcanum eclipse those of the portico. That mysterious agency or force called electricity has been utilized, not merely for the benefit of bulls and bears, or for hundreds of utilitarian purposes with which we are familiarized every day, but it has been used as a fairy finger to probe nature's hidden structure, and, as it were, enable us to *feel* what the spectroscope has revealed to sight.—*Popular Science Monthly.*

The Early Scientists.

The contemplation of the progress of science in our days shows us a whole host of zealous investigators bringing stone after stone to raise to a prouder hight the structure of knowledge whose richly diversified pillars and towers, seemingly disposed without order, all contribute to the common design. From this view we readily turn to the foundations and basement stones of the edifice, which, gray and weathered as they seem to be, yet form the basis of the heaven-aspiring building. Our greatest interest is enlisted in the story of the men who, amid the general perversion of manners and contempt for all learning of the middle ages, lived for knowledge in their study-rooms or shut up in silent cloisters. Although they did not make any great discoveries, they still endeavored to keep alive the little flame which yet shone weakly from the intellectual fires of antiquity. Still more fascinating are such views in the case of men who came out into the life of the times, and, with their sharp minds schooled in the philosophy of the ancients, entered actively into the often erratic course of the world, and by word and writing presented themselves undismayed before those in power—here checking the spirit of boundless avarice and wild excess, there defending the oppressed.—*Popular Science Monthly.*

COLORS AND WARMTH.—It may not be generally known, says London *Truth*, that a man wearing dark clothes is more liable to infection from contagious diseases than he who wears light-colored garments, because particles which emanate from deceased or decaying bodies are much more rapidly absorbed by dark than by light fabrics. This is easy of proof. Expose a light and dark coat to the fumes of tobacco for five minutes, and it will be found that the dark one smells stronger than the other of tobacco smoke.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Feb. 9.		Week Ending Feb. 16.		Week Ending Feb. 23.		Week Ending Mar. 2.	
Alpha	2.15	1.60	2.10	1.80	1¾	1.40	1.70	1
Alta	5⅝	5	4.40	3	3.95	3.10	3.20	3
Andes	70c	65c	65c	50c	50c	45c	50c	35c
Albion	2¼	2.10	2¼	1.90	1.95	1¼	2	1.85
Argenta	....	....	....	....	....	....	....	....
Addenda	....	....	....	....	....	....	....	....
Belcher	1.10	1	1.05	55c	70c	40c	50c	35c
Belmont	70c	....	70c	....	....	....	60c	40c
Best & Belcher	7⅜	7¼	7⅛	6⅜	6¼	6¼	6⅝	5¼
Bullion	95c	65c	85c	45c	75c	60c	1.20	60c
Bechtel	35c	....	....	....	40c	....	....	....
Belle Isle	....	....	....	....	....	....	5c	....
Bodie	3.55	3.35	3.40	3	3¼	2.95	3.90	3
Benton	1.05	95c	75c	65c	85c	70c	70c	60c
Bulwer	2¼	....	....	....	2¼	2.40	2.40	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	....	....	....	....	....	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	5c	....
Caledonia	25c	15c	20c	15c	10c	....	15c	10c
California	25c	20c	20c	10c	35c	10c	35c	20c
Challenge	40c	....	40c	....	50c	....	....	....
Chollar	1¼	1.10	1.35	1.05	1.20	1.05	1.20	95c
Confidence	1½	....	1½	1¼	1¼	1.10	1.40	90c
Con Imperial	15c	2c	10c	....	10c	....	10c	....
Con Virginia	75c	70c	70c	50c	65c	45c	50c	30c
Crown Point	75c	70c	75c	55c	65c	40c	45c	35c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	80c	....	....	....	....	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	5c	....
Derbec	....	....	....	....	....	....	....	....
Eclipse	85c	80c	85c	80c	85c	....	1.30	85c
E. Mt. Diablo	45c	40c	45c	35c	40c	30c	35c	....
Eureka Con	12	11¼	12½	11½	13	12¼	13	12½
Exchequer	75c	65c	75c	55c	70c	45c	60c	35c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	2½	2	2	1.80	2	....	....	....
Goodshaw	40c	35c	50c	30c	50c	40c	40c	....
Gould & Curry	3.80	3.30	3.40	2.90	3.45	3.15	3.35	2.85
Hals & Norcross	2.45	2.15	2¼	1	1.70	1½	1.60	1¼
Head Center	70c	40c	15c	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	5c	....	5c	....	25c	....	20c	....
Justice	1.10	95c	95c	75c	90c	70c	75c	70c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	80c	....	85c	....	....	....	70c	15c
Consuls	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	1c	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	1½	....	1½	1½
Martin White	3⅜	3.20	4.60	4.10	4.45	4.05	6	5½
McClinton	....	....	10c	5c	....	....	....	....
Mono	....	1	1	95c	1	90c	1.60	45c
Mexican	10⅜	9⅛	10⅛	8⅜	9⅜	8⅜	10	8⅜
Mt. Diablo	7⅜	....	7⅜	6½	7⅜	6¼	6⅜	6¼
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	1
Noonday	25c	20c	30c	20c	....	....	25c	20c
New York	....	....	....	....	....	....	....	....
Northern Bells	11	10½	11	9½	10½	9½	10¼	9½
Nortb Noonday	10c	....	....	....	....	....	25c	....
Navajo	60c	55c	65c	40c	....	....	35c	....
Occidental	90c	....	....	....	60c	....	80c	75c
Ophir	5⅜	5½	5½	4¼	4.80	4.10	5	3.80
Original Keystone	....	....	....	....	....	....	....	....
Overman	1¼	75c	1.10	65c	80c	55c	55c	45c
Oro	30c	10c	30c	25c	25c	20c	35c	25c
Paris	....	....	....	....	....	....	....	....
Potosi	1½	1.40	1.30	1.05	1.20	1	1.15	90c
Queen Bee	5c	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	2.10	1¼	1.85	....	1½	1.65	1.35	1¼
Seg Belcher	5.55	5¼	4.05	3	....	....	1¼	1
Sierra Nevada	9¼	8⅜	8⅜	7	7⅞	6⅜	8¼	6
Silver Hill	10c	....	....	....	5c	....	....	....
Silver King	19	18⅜	19	18⅜	18⅜	18⅜	18⅜	18¼
Succor	....	....	....	....	....	....	....	....
Summit	10c	....	....	....	....	....	....	....
Scorpion	95c	90c	90c	70c	75c	65c	90c	65c
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	....	25c	....	15c	....	....	25c	20c
Tioga Con	....	....	25c	20c	20c	10c	....	....
Tiptop	....	....	....	....	4¼	4.10	4.20	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	11⅜	10⅛	11⅜	9⅛	10⅜	10⅛	11⅜	9⅜
Utah	5⅝	5	5⅜	4.95	5⅜	5⅛	5⅜	5
Ward	....	....	3.70	3⅛	....	....	3⅛	....
Wales	1	90c	85c	70c	55c	50c	60c	55c
Yellow Jacket	2.55	2.15	2.05	1⅛	1.65	1	85c	65c

Sales at S. F. Stock Exchange.

Thursday A. M., Mar. 2.

210 Alta 3.05
253 Andes 4c
50 B & Belcher 6¼
300 Belcher 35c
250 Bullion 90@85c
100 Benton 60c
500 California 30c
33⅓ Con Virginia 40@35c
120 Chollar 1.05@1.10
50 Crown Point 35c
200 Con Imperial 10c
140 Exchequer 55c
65 Gould & Curry 3.15@3.20
185 Hale & Nor 1.45
200 Justice 75c
100 Kentuck 70c
150 Mexican 9
380 Ophir 4.30@4¾
100 Overman 55c
365 Potosi 1.10
930 Savage 1.30
180 Sierra Nevada 7⅛@7⅜
75 Seg Belcher 1¼@1⅛
350 Scorpion 85@90c
260 Union 10¼
105 Yellow Jacket 65c

AFTERNOON SESSION.

200 Albion 1.90
140 Bodie 4@4.05
400 Belding 25c
250 Bodie Tunnel 1.45
600 Concordia 50c
100 Day 85c
10 Eureka Con 12½
495 Eureka Tunnel 1.40
200 Gen. Jackson 90c
100 Holmes 30c
100 Mt Diablo 6⅝
200 Mono 1¼
16 M White 6¼
25 Northern Belle 9¼
270 Oro 40@45c
180 Pinal 3.35
125 Southern Nev 6@5⅞
100 Tioga Con 20c

Bullion Shipments.

We qnote shipments since our last, and shall hs pleased to receive fnrther reports:

Standard, Feb. 20th, $15,513; Northern Belle, 20th, $8,599; Contention, 18th, $20,429; Eureka Con., 16th and 18th, $10,600; Mt. Diablo, 21st, $6,770; Christy, 20th, $2,213; Contention, 23d, $11,085; from Butte M. T., week ending 11th, $46,280; Eureka Con, 21st, $5,368; Star, 20th, $2,497; Leeds, 18th, $960; Germania, 21st, $4,950; Hanauer, 21st, $2,700; Barbee & Walker, 21st, $1,386; Tintic, 21st, $2,001; Horn Silver, 21st, 17 500; Germania, 18th, $5,500; Hananer, 18th, $2,350; Stormont, 18th, $3,750; Hananer, 23d, $9,100; Horn Silver, 20th, $17,000; Tintic Mammoth, 17th, $2,100; Mack Morris, 22d, $10,694.

THE State Congress of Sonora has abolished all tax on mines, mining improvements, machinery and capital invested, and proposes to make a light tax only on the net proceeds of mines.

THE Homestake, the famons gold mine of the Black Hills, has recently struck another enormous ore body.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes S M Co	Nevada	18	25 Feb 2	Mar 9	Mar 30	B Burris	309 Montgomery st
Belcher S M Co	Nevada	29	50 Feb 6	Mar 11	Mar 31	J Crockett	327 Pine at
Belvidere M Co	California	13	25 Feb 9	Mar 14	Apr 3	C W Hubbard	310 Pine st
Bullion M Co	Nevada	22	30 Jan 19	Feb 21	Mar 14	J M Brazell	328 Montgomery at
California M Co	Nevada	2	20 Jan 18	Feb 25	Mar 22	C P Gordon	309 Montgomery st
Champion M Co	California	10	25 Jan 12	Feb 20	Mar 13	B Burris	309 Montgomery at
Chollar M Co	Nevada	7	25 Jan 9	Feb 14	Mar 7	W E Dean	309 Montgomery at
Con Pacific M Co	California	4	25 Jan 28	Mar 3	Mar 27	F E Lutz	330 Pine at
Con Virginia M Co	Nevada	17	30 Jan 31	Mar 11	Apr 8	A W Havens	309 Montgomery at
Crown Point G & S M Co	Nevada	47	25 Feb 16	Mar 23	Apr 13	J Newlands	327 Pine st
Day S M Co	Nevada	10	50 Jan 28	Mar 6	Apr 3	E M Hall	327 Pine st
Equitable T & M Co	Utah	26	10 Feb 2	Mar 9	Mar 23	O J Collins	612 Montgomery st
Exchequer M Co	Nevada	18	25 Jan 12	Feb 15	Mar 6	C E Elliot	327 Pine st
Gould & Curry S M Co	Nevada	41	50 Jan 12	Feb 16	Mar 9	A K Bnbrow	309 Montgomery at
Independence M Co	Nevada	9	15 Feb 24	Mar 31	Apr 24	E M Hall	327 Pine st
Julia Con M Co	Nevada	17	20 Jan 17	Feb 24	Mar 16	H A Charles	419 California st
Martin White M Co	Nevada	11	25 Jan 20	Mar 2	Mar 30	J J Scoville	309 Montgomery at
McWillen M Co	Arizona	4	30 Feb 8	Mar 14	Apr 12	J Morizio	328 Montgomery at
Modoc Con M Co	California	10	30 Feb 14	Mar 28	Apr 25	J W Pew	310 Pine at
Mono G M Co	California	16	30 Feb 7	Mar 14	Apr 3	W H Lent	309 Montgomery at
New York M Co	Nevada	27	15 Jan 18	Mar 7	Mar 28	F E Dietz	327 Pine at
North Noonday M Co	California	5	25 Dec 30	Feb 10	Mar 6	W J Taylor	310 Pine st
Overman S M Co	Nevada	52	50 Jan 9	Feb 14	Mar 7	Geo D Edwards	414 California st
Pinal Con M Co	Arizona	2	30 Jan 24	Mar 7	Apr 3	W W Traylor	309 Montgomery at
Rex Montis M Co	California	14	25 Jan 9	Feb 14	Mar 10	J W Ward	426 California st
San Jose M Co	Nevada	18	75 Jan 30	Mar 15	Apr 19	A Carrigan	109 Front st
Seg Belcher M Co	Nevada	21	1 00 Feb 14	Mar 20	Apr 10	G D Edwards	414 California st
Silver Hill M Co	Nevada	17	15 Feb 2	Mar 9	Mar 29	W E Dean	309 Montgomery st
Spanlding G & S M Co	California	2	10 June 23	Feb 23	Mar 24	J W Pew	310 Pine at
Tioga Con M Co	California	15	10 Jan 12	Feb 16	Mar 8	W H Lent	309 Montgomery st
Tombstone Con G & S M Co	Arizona	1	02 Jan 3	Feb 13	Mar 6	J M Buttington	309 California st
Utah S M Co	Nevada	37	1 00 Jan 14	Feb 17	Mar 7	G C Pratt	309 Montgomery at
Yellow Jacket S M Co	Nevada	44	1 00 Feb 7	Mar 4	Apr 11	M Otey	327 Pine st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Bay State S M Co	Nevada	1	02	Dec 29	Mar 1	Mar 27	J W Pew	310 Pine st
Bed Rock M Co	Arizona	1	05	Feb 6	Mar 13	Apr 3	O H Graves	6 Post st
Blue Bell Con M Co	Nevada	2	50	Jan 19	Feb 24	Mar 17	H P Bush	431 California st
Butte Creek Hydraulic M Co	California	8	10	Dec 29	Feb 15	Mar 6	A L Taylor	230 Montgomery st
Cahorca M Co	Mexico	5	30	Feb 25	Mar 29	Apr 17	W L Elliott	220 Sansome st
Equator M Co	—	—	20	Feb 27	Apr 11	May 8	Wm Willis	309 Montgomery st
Excelsior Deep Grav M Co	California	17	25	Jan 10	Feb 14	Mar 7	D B Chisholm	327 Pine at
Excelsior W & M Co	California	3	1 00	Jan 9	Feb 10	Mar 2	L C McAfee	328 Montgomery st
Golden Fleece Grav M Co	California	24	30 00	Jan 31	Mar 4	Mar 23	Fr Schirmier	785 Folsom st
Gopher Con M Co	Nevada	2	50	Jan 11	Feb 20	Mar 20	H Deas	309 Montgomery at
Little Chief M Co	California	1	5 00	Jan 13	Feb 17	Mar 10	S G Dean	23 California st
Metallic M Co	—	—	20	Jan 27	Mar 17	Apr 11	May 9	Wm Willis	309 Montgomery st
Metallic-Equator M Co	—	—	20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery at
Oro M Co	California	11	15	Jan 7	Feb 13	Mar 7	W Stuart	320 Sansome at
Pinal Copper Co	Arizona	3	2 50	Jan 28	Mar 6	Mar 27	Geo T Shaw	840 Fourth at
Rocky Point M Co	California	10	05	Jan 13	Feb 13	Mar 6	D M Ke t	330 Pine st
San Pedro C & S M Co	California	4	03	Feb 27	Apr 3	Apr 27	W G Holmes rm 1, Sherman's build'g
Sizcorner G & S M Co	California	3	03	Jan 24	Feb 23	Mar 21	A Judson	320 Sansome st
South Hite G M Co	California	3	10	Jan 9	Feb 16	Mar 7	F A Berlin	420 Montgomery at
Vanderbilt M & M Co	Nevada	3	05	Jan 16	Feb 24	Mar 16	J Morizio	328 Montgomery at

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Concordia M Co	—	W J Taylor	310 Pine st	Annual	Mar 6
Golden Chariot M Co	Idaho	J T McGeoghegan	318 Pine st	Annual	Mar 6
Hale & Norcross S M Co	Nevada	J F Lightner	309 Montgomery at	Annual	Mar 8
Joe Davis G & S M Co	California	B F M Benson	420 California st	Stockholders	Mar 14
Lucky Hill Con M Co	—	H A Unruh	Baldwin Hotel	Annual	Mar 6
Marsland Con M Co	—	E P Farnsworth	219 Sansome at	Annual	Mar 6
North Sierra Nevada S M Co	Nevada	C C Harvey	309 California st	Annual	Mar 14
Potosi M Co	Nevada	W E Dean	309 Montgomery st	Annual	Mar 8

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willis	309 Montgomery at	10	Feb 13
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Feb 15
Silver King M Co	Arizona	J Nash	315 California st	25	Feb 15
Standard Con M Co	California	Wm Willis	309 Montgomery at	75	Feb 13
Standard Con M Co	California	Wm Willis	309 Montgomery st	75 (extra)	Jan 12
Vizina Con M Co	Arizona	J E Haskell	30 Pine at	10	Jan 3
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10 (extra)	Jan 3

The Mining Share Market.

There is nothing specially worthy of note in the market of this week. At the regular weekly execntive session of the San Francisco Stock and Exchange Board, Wednesday, the committee on the proposed grain call reported progress, and it was stated that when the necessary rules and regnlations governing the new bnsiness had been drafted, a full report wonld he snbmitted for the action of the Board.

The following stocks have been stricken from the San Francisco Board list for non-payment of dues: Buckeye, Dayton, Niagara, Ward, Sonth Justice, Morning Star, Solid Silver, St. Lonis, Golden Gate, Flowery, North Bonanza, Fairfax, Margarita, Concordia (Va.), Monntain View, El Dorado Sonth, General Thomas, Paradise Valley, Real Del Monte, McClintou, Anrora, Sonth Bodie, Sonth Standard, Richer, Crœsus, University, Jupiter, Sonth Bnlwer, Defiance, Mammoth, Glynndale Con., Original Hidden Treasnre, Naumkeag, Caledonia, B. H., Giant and Old Abe, Eagle, East Noonday.

The miuing companies this week paid $405,-750 in dividends.

The Indian Queen Mining and Milling Co. paid its 21st dividend of 2½% at Boston last month. This brings np the total to $318,500. The works are in Esmeralda connty, Nev., and the mine was formerly managed here.

The Vizina Mining Co., of Arizona, paid its regnlar monthly dividend of 10 cents per share or $20,000 Tnesday. Since Nov. 1, 1880, this company has paid five regular dividends of the same amount, and one extra dividend, making $120,-000.

At the Crown Point and Belcher they have shnt down and ceased pumping. The water appears to have been gradnally risiug, notwithstanding that it was snpposed to have ahont found its level last Saturday, as it had yesterday reached the 2300 level. The Yellow Jacket pumps are still kept rnnning, but there is talk that they will he shut down nnless arrangements are made hy which the other companies interested will come forward and pay their proportion of the work. Superintendent Taylor is now in San Francisco and this matter will undonhtedly he arranged, when all hands will join in a determined attack npon the water.

The mnch-desired connection hetween the 2400 level of the Savage and the main incline, says the *Enterprise*, is made at last. A hole was knocked throngh Friday night ahont 10 o'clock. The hlast that did the business was fired from the Chollar-Norcross-Savage side—that is, at the head of the npraise. Had this charge not blown ont a hole, they were all ready to pnt in a charge at the hottom of the incline above. It is really an important connection, and all will rejoice to know that we shall now soon see work progressing in the middle mines. If the connection will do all that is expected of it, it will enable all the middle miues—Hale & Norcross, Chollar and Potosi—to actively explore their gronnd.

NYE, THE LARGEST COUNTY IN THE UNITED STATES.—The Virginia *Chronicle* says: A hulletin just issued from the Censns Office, showing the approximate areas of the several States and Territories, contains mtch matter of curious interest. Texas, the largest State, has an area of 262,290 sqnare miles. Nye county, Nevada, is the largest county in the United States, covering 24,000 sqnare miles; San Bernardino, California, with 23,000 sqnare miles, is the next largest. California has four other counties, each of them as large as Massachnsetts; three that are each larger than Connecticnt; and fifteen others that are each larger than Delaware. Sionx county, Nebraska, contains 21,000 sqnare miles. Oregon also has several large counties—Grant, Umatilla and Lake—contaiuing respectively 17,500, 14,260 and 12,000 sqnare miles. Presidio, with 12,500 miles, is the largest county in Texas. The smallest conuty in the United States is New York, State of New York, and it has the largest population.

A CORRESPONDENT writing from Gray's Harbor, W. T., says: There is quite an excitement on the north side about gold. They are taking ont $20 per ton washing black sand. They have strnck a lead 18 inches thick, running back into the heach. About 20 claims have been taken, and all expect to make fortnnes.

THE citizens of Tnscarora, Nev., have organized a Committee of Safety for the pnrpose of ridding the commuuity of petty larceny thieves and other evildoers who infest it.

SEVERAL good "strikes" are reported in the Total Wreck district, Arizoua. Some of the newly discovered ores are of a high grade and assay quite largely.

IT is said that operations will he resumed in the Tyho mines, and that next snmmer will see the fnrnaces rnnning.

FROST on the Comstock has penetrated mining shafts 700 ft, freezing dripping water at that depth from the snrface.

MINING SUMMARY.

Ths following is mostly condensed from journals published in the interior, in proximity to ths mines mentioned.

CALIFORNIA.

AMADOR.

ZSBLE.—Amador *Ledger*, Feb. 25: We ars glad to say that all reports indicate that this mine is in a prosperous condition. At the new level just opened up, the ore body has widened out to immense proportions—30 ft, it is said. Tbers is snough rock in sight to run ths mill for ysars. A rumor bas gained currency that 40 additional stamps are to he added to tbs mill, but whsther trus or not, we are unable to say. Everything looks as though tbs mine was paying well.

EMPIRE.—This Plymouth mine has been on the improve lately, as regards the quality of ore extracted. It is now tbought that it is on a paying basis. The employees are paid off regularly every month.

PACIFIC.—This mine and mill sre under full headway. No clean-up has been made as yst, but thers is no question that ths quartz will yield handsomely.

SUTTER CREEK.—Some 6 or 8 hands bave been discharged from ths Amador Con. mine. The company have concluded to prospect with less men. Nothing of consequence has been developed as yet, but the company will persevere in prospecting operations, and let us hope that tbeir enterprise will ers long be amply rewarded. The Mahoney is plodding along, keeping ths 40 stamp mill running constantly. The employees were paid off last week. Both sulphuret works are idls and have been for soms time, but they ars expected to start up in ths course of a month.

PLYMOUTH.—Cor. Amador *Dispatch*, Feb. 25: As ws are underground almost all our spare time, ws don't know much about what goes on on top of ground, but in passing to and from our work we notice the two powerful mills—the Empire and Pacific—and hear their thunder as they reduce ths auriferous ore that is entrusted to tbeir ponderous jaws. Ths water supply from the Amador canal pipes is not perfectly establishsd as yet on account of leakags and occasional breaking of the pips, but will be all right in a short time. Those able engineers, Mr Georgs Barbam and Mr. Regan, have it in charge, and will spare no pains to make it carry the water in a satisfactory manner. All the otber quartz mines ars working steadily, sinking or taking out ore. All seem satisfied and prosperous.

BUTTE.

THE TREASURE BOX.—Butte *Record*, Feb. 25: Tbis is the name given to the claim under Table mountain, near Thompson's Flat on ths north side of Feather river, into which tbe company are now running a tunnel. The tunnel is now in 2,200 ft. and has passed several streaks of gravel that prospect well. Tbey are at work on the bedrock, the level of their tunnel running pretty evenly therewith. It may be they will strike the bedrock pitching one of these days, and then it may prove a "treasure box," indeed. It is known that the bedrock is much lower over toward Schirmer ravine than tbo point now reached by the tunnel.

CALAVERAS.

NOTES.—*Mountain Echo*, Feb. 21: A nugget of gold weighing $130 was found by a Chinaman near this place one day last week. The Fletcher Bros. are at present sinking a shaft on Dead Horse hill with favorable prospects. The Monarch M. Co. have bad an offer of $60 per ton for the sulphurets extracted from their gravel mine at Monarchville. John Osborn, one of the owners of the Gold Hill mine, while at work the otber day, picked up a piece of quartz containing over $40. A strike has been made in James Lee's mine in Bald hill, and as high as a dollar to the pan has recently been taken out.

MURPHYS.—The hauling of quartz to the Boston Co.'s mill has been resumed, and we are informed the mill will start up soon. Moss & Stone's mill in Owisburg will start up also on the same Co.'s second grade ore, about the same time. This mill is situated in close proximity to the Red Wing mine. It is said that there is some very fine ore being extracted from the mine, and appearances indicate an abundance of it.

INYO.

KEYNOT.—Inyo *Independent*, Feb 25: Since the resumption of active mining by the Keynot company, under Supt. Fuentes' direction, late reports are quite important. It appears that the San Francisco experts—the doubting Thomases, who have been inspecting the property so frequently of late—had discovered a mare's nest, so to speak; they saw, or pretended to, that the ore breast at the end of the lower tunnel, 130 ft in, was in ore, but that said ore was not rich as that mined out before. Some of the owners were apparently of the same mind, rendering it somewhat difficult for the superintendent to induce them either to go ahead with the work or abandon the plan of selling the mine. The work of opening out the ledge, however, has progressed some 15 ft. further, and the result has been the opening up of an ore chute of body 3 ft wide which averages from $500 to $1,000 per ton! It is a case calling for a renewed examination by these so-called San Francisco "squirts."

MONO.

BODIE.—*Free Press*, Feb. 28: There is nothing to report from the mines to-day which affords any peculiar significance. The Standard Con. sent 1,261 tons of ore to the mills and shipped $29 213 95 to San Francisco. Crosscutting from the 714 level of the Oro was commenced on the 25th. A south lateral drift in the Tioga has been started from the east crosscut, 962 level, and has been driven 13 ft. The bottom of the tbs drift is in quartz of a good quality. The recent activity in Bodie Con. and Mono, which resulted in an advance in those securities, is probably based on rumors of favorable developments on the 800 level of the Lent shaft.

NEVADA.

SPENCEVILLE MINING NOTES.—Nevada *Transcript*, Feb. 25: Mr. Leahy has just returned from the lower part of the county, and says that the mining outlook in the vicinity of Spenceville is encouraging. The copper mining company are working about 90 hands, 50 of which are Chinese. The ores now are reduced by the leaching process. Last month the company paid its first dividend, and the indications are that the stockholders will henceforth realize returns regularly. Mr. Livermore, who lives at Livermore Valley, and 3 others have been prospecting with marked success, their claim adjoining Slater's ranch, a mile and a half below Spenceville. The tunnel is in 130 ft where they have struck a ledge 24 ft thick, and said to be rich. Rock taken by a disinterested person and treated by Supt. Ellis of the copper mine, assayed $1,700 a ton in free gold. The owners feel greatly elated over the strike, which is generally conceded to be one of real value.

PLUMAS.

ONLY RUMOR.—Greenville *Bulletin*, Feb. 22: Several reports have been current on the street for some days about the Plumas National mine. There is not a word of truth in any of these reports, nor will anything be determined on by the company until after Mr. Russel shall return to New York.

MINE OFFICERS.—L. D. Cortright, W. S. Carter, Augustus Storrs, Francis H. Tucker and R. E. Brewster have been elected Trustees of the Gold Stripe Mining Co. The mine is in this district and the election took place in New York. Mr. Cortright was chosen President and Treasurer, and J. J. Pardee, Secretary.

SAN BERNARDINO.

THE MINES NEAR RIVERSIDE.—*Press and Horticulturist*, Feb. 25: On the 23d of February, 1881, several of our citizens became very much interested in the discovery of a fissure of gold-bearing rock, which was traced for two or three miles, starting at a point on the south side of the

Terquesquite arroyo, southeast of town, and extending in a southwesterly direction towards the celebrated Temescal tin mines. Several days and nights were spent in locating claims and many prospect holes were dug. Assays of the rock not proving satisfactory all work was abandoned and the locations were nearly forgotten by the locators as well as the public generally. One day last week another start was made by David Meacham. He brought samples of the rock to town and submitted them to a fire test in a blacksmith's forge. The result was that a metal resembling tin was forced from the rock which spread out upon the shovel as large as a half dollar. This test was repeated several times with the same result. Some of the knowing ones immediately bought up some of the old claims at nominal figures, and in a day's time prospecting was again resumed all along the line. David Meacham entered into a contract with the claim owners to sink a shaft 50 ft and crosscut until the ledge was found, the compensation being a certain interest in the claims. On Wednesday a piece of the rock was taken to San Bernardino, and an assay resulted in finding 2½ per cent of tin. As yet no well-defined ledge has been found, but the croppings are good and the prospects of finding a rich ledge are fair Whether tin or any other valuable metal will yet be found in paying quantities still remains to be seen. We learn that samples of the rock will be sent to San Francisco for further assaye.

SIERRA.

The Ruby Drift Mine.—Sierra *Tribune*, Feb. 23: At the Ruby drift mine a new raise is being run 50 ft above and 400 ft ahead of the main tunnel. Work is being prosecuted in what is supposed to be the main channel, and it is expected to strike pay gravel in a short distance. Whenever this object is gained, the main tunnel will be pushed ahead, and connection made with the drift above. This channel is, beyond a doubt, a continuation of the famous Bald Mountain lead, which has paid dividends to its owners from the time it was discovered, some years ago.

Bald Mountain Extension Mine.—Last Saturday the Extension Co. struck into very fine-looking gravel. The main tunnel had been run east 140 ft, and in raising 22 ft the main channel was tapped. The company had found it necessary to discharge some of their force in the past few days, to await further developments. We are pleased to say that the company's prospects were never better than now for opening out a permanent and paying mine.

Monthly Statements.—The following is the statement rendered by the Sierra Butte Mining Co. for the month of December. Total receipts, $27,393; total working expenses, $20,037. For the Plumas Eureka mine, located in Plumas county, the following was rendered: Total receipts, $43 971, total working expenses, $20,971; outlay on improvements, $591. The Mammoth mill was not run during the month. The Arizona Drift Mining Co. have suspended operations at their mine, and work will not be resumed until the law suit brought by the Carney brothers against them is decided.

Scales Digging.—The Union Hill hydraulic company cleaned up $5 000 last week as a result of 4 weeks' washing. This was very satisfactory to the owners The Fairplay company exploded a powder drift last week which did very good execution. One of the workmen ventured into an adjoining drift immediately after the explosion to see if it had broken through, when he encountered gas. Fortunately he was able to reach the outside but the effect rendered him insensible for a few moments

TRINITY.

Mining Outlook.—Trinity *Journal*, Feb. 25: Up to the present time the prospect for hydraulic mining this season has, on the surface, appeared bad, and, with characteristic despondency, miners themselves have been wont to predict the season a "dead failure" as regards the mining interest. While the facts will not justify us in saying that this will be one of the best years for mining, there are far from upholding the ultra-despondent view of the miners which we have so often heard of late, but the weather, past and present, seems to insure a fully average season. Up to this time upwards of 20 inches of rain and more than 50 inches of snow have fallen at this place, and, while all of this has made little or no water, that very fact augurs well for the water supply in the near future. There has been a long-continued freezing spell, which has checked the flow of water and reservoired it in the mountains, the gulches and the ground at our very doors, and which will now be loosed by the present warm and gentle showers and at once furnish abundant water for mining purposes This supply will in all probability be continuous and last from 3 to 4 months, during which time of constant mining more work will be done than in 6 to 8 months of from 3 to 8 hours water per day, and the profits on such work will be more than in proportion. We expect good hydraulic work from now until far into the month of July, or nearly, if not quite, 4 months' run, and in this event a production of the precious metal in Trinity county fully equal to that of last year.

NEVADA.

WASHOE DISTRICT.

Sierra Nevada.—Gold Hill *News*, Feb. 27: On the 2700 level the north lateral drift has been extended 20 ft. The joint Union Con. east winze has been sunk and timbered 9 ft.

California.—On the 1650 and 1750 levels are still repairing drifts and winzes connecting with the old Con. Virginia.

Ophir —Are repairing the main incline and joint east crosscut on the 1700 level.

Gould & Curry and Best & Belcher Shaft.—The drill from face of the west crosscut was run a distance of 172 ft; total distance from shaft to end of drill-hole, 907 ft.

Con. Virginia.—On the 1650 and 1750 levels are still cleaning out and repairing drifts and winzes connecting with the old Con. Virginia shaft.

Mexican.—On the 2700 level the main north lateral drift has been extended 24 ft. On the 2900 level the main north drift has been advanced 20 ft.

BRISTOL DISTRICT.

Mayflower.—Bristol *Times*, Feb. 18: An important feature has lately been developed in the Mayflower, the ore in the bottom of the winze turning from milling into heavy gray carbonate, averaging 3% in lead, and running all the way from $65 to $2,400 in silver. The uncovering of this rich heavy lead ore in addition to the immense amount of high grade rock in the upper levels, is a big thing for the Bristol company, as upon the erection of smelters, more ore can be reduced per day and worked to a closer per cent. than by the milling process; quicker and larger returns made, and the county benefited generally by the necessary employment of more men and the addition of reduction works to those already in the district.

Strike in the Noonday.—A strike was made last week in the Noonday, adjoining Gilmer & Salisbury's property and quite a whirl of excitement created by the rumor that the "rich float ledge" had at last been found, as at duck the other evening Eugene Howell was seen to have secretly brought down a whole buggy load of specimens closely resembling the float and one piece in particular covered with a green chloride, and which looked as if it would run up in the thousands. It was but a second before the report spread like an electric flash that the "rich float ledge" had been struck. But to ascertain the true facts of the case and upon inquiry of Oene as to where it came from, he knowingly winked and gave us to understand that it was from the Noonday and that he only had 8 lt of it, so we passed. He afterward informed us that a large body of ore had been struck between shaft No. 1 and 2, which, from appearances, would go up in the hundreds. Upon the strength of the strike one quarter of the mine was sold two days ago to a well known party here for $4 a foot. The opealag up of the body of ore in the Noonday has necessitated the resumption of work upon shaft No. 1, which will be put down with all possible speed to a depth of 50 ft below the present cave level and drift run north upon the vein and connection made south with drift from shaft No. 2.

Day.—Drift from 700 level in the Day is in 70 ft, soft open ground with face carrying large bunches of ore and iron. Every indication goes to show that the 620 will be tapped sooner than expected.

Mill.—The Bristol mill is pounding away on high grade rock and turning out more than the usual amount of bullion. A plentiful supply of water on hand and everything running in and about the mill as ordinarily.

Ore.—Ore was encountered last week in the Loro Valo from bottom of winze at end of tunnel No. 1. Since last report the ore is coming in strong though of a low grade, and carrying a heavy per cent. of iron and lead. A few more feet will bring them into the ledge proper where it is thought that the main chimney of ore lies. Everything is favorable to the opening out of a large body of ore at no distant date.

CANDELARIA DISTRICT.

Northern Belle.—*True Fissure*, Feb. 25: Twelve ft have been added to the depth of the main shaft since last report, the total distance made to the 20th inst., being 75 ft. The daily yield of ore has been about 60 tons. Bullion shipments for the week ending Feb. 23d, $15,221.90. Shipments on February account to Feb. 23d, $45,701.78.

Mount Diablo.—The east drift on the second level shows no change, while the ore below the north crosscut, near the center of the mine, on the level, is opening very well and looks promising. It shows a fine body of chloride assaying from $200 to $400 per ton. Bullion shipments for the week have been $8,525.28 on the 18th inst., and $6,770.97 on the 21st inst.

EUREKA DISTRICT.

Better Times Coming.—Eureka *Leader*, Feb. 13: Times in Eureka are bound to improve during the next 30 days, as more men will be put to work and the bullion yield will be increased. In a few days another furnace will be started up at the Eureka Con. on tribute ore. It is said that several hundred tons of this ore is ready for shipment and that a large amount lies broken in the mine. When the new furnace starts up the men who have been so long working and extracting ore with no returns will receive money and spend it, then flush times may be looked for.

Reported Strike.—*Sentinel*, Feb. 25: News was brought to town yesterday afternoon that a strike had been made in the Prospect Mountain tunnel, and some fair looking galena ore was exhibited as coming from the find. Little information on the subject could be obtained. It seems that the miners have finished their contract to open out 100 ft, and the ore encountered is at the point where their job ends and covers the entire face of the tunnel. Mr. R. K. Morrison, the secretary of the company, tells us that the reported strike occurs 1850 ft from the mouth of the tunnel and at a vertical depth from the surface of 900 ft. Some of the stock, which has been held at 50 cents, exchanged hands on the street yesterday at 75 cents per share, the miners who have worked on the contract being the purchasers. It is to be hoped that the find is substantial The policy of the company, so far, has been to push the tunnel deeper into the mountain without stopping to drift or crosscut. Should the present find prove to be extensive they may stop to develop it and take out ore for working.

GRANTSVILLE DISTRICT.

The Centennial Mine.—*Bonanza*, Feb. 25: Work goes bravely on in the Centennial mine with the most flattering results; In the west shaft ore of a very fine grade is encountered. This mine is developing rapidly into one of the finest properties in the district. We understand that it is the intention of the company to erect steam hoisting works, sink a big shaft and open up the mine in good style.

GOLD PARK DISTRCT.

Progressing.—Orontsville *Bonanza*, Feb. 25: Everything moves along steadily in this promising camp. Work at the mines progresses and enough ore is extracted to keep the reserve a good way ahead of the mill. At the mill things are running smoothly and it is expected that the clean-up will make a handsome showing.

IONE DISTRICT.

Sale.—Late advices report the sale of the Ural mill, mines and personal property to an Eastern party, who will incorporate under New York State laws and proceed to business at an early day. The new company will work the Storm King and Victor mines, and will in the spring overhaul their mill and put it in first-class order for business.

Items.—James P. Sargent and Frank Taglaibue, of San Francisco, owners of the North Star and other mines, write they will soon be here to arrange matters for an incorporation on their mines. Mons. Chattel has bonded from Joe Bell an old mine near the Storm King for six months at $4,000. Remarkably rich float found by Mons. Chattel on the ground was the cause of this sudden miae transaction. One thousaud dollars to aid the finding of the ledge this remarkable ore came from is guaranteed.

LEWIS DISTRICT.

Starr-Grove.—Lewis *Herald*, Feb. 22: The main incline on the Starr-Grove mine is being sunk at a good rate. The character of the ore is different from that heretofore taken out, the quartz having a more milky appearance. The ledge is about 6 ft wide. The Bothwell winze is also deepening fast, with a well-defined hanging wall. The width of the ledge is not known as the foot wall has not been encountered. This winze will be a double compartment and is being substantially timbered. The ledge in the stope is in places 9 ft in width, very rich ore running through it. About half the force were laid off Sunday, as sinking only will be prosecuted for the present.

Highland Chief.—Sinking the main incline is still continued; also running the south drift. But little change has taken place in the appearance of the ledge since last week.

Chloride.—The main tunnel on the Chloride mine is still being driven ahead; the ledge is still broken, but the walls are well defined.

Morning Star.—Work on the Morning Star mine is being pushed ahead vigorously. The Morgan incline had attained a depth of 133 ft on Saturday last. The ledge is looking well, and the ore of good quality. A large block of ground is opened up ready for stoping.

Evening Star.—A force of men will be placed on the Evening Star mine right away. The snow has been shoveled off the trail to the mine, and the shaft cleaned out preparatory to resuming work. Samples of ore have been brought down from the mine, some of them looking first rate.

Emma.—The contractors on the Emma mine have made good headway during the week both in sinking and running the main tunnel. The ledge has not been cut yet.

Eagle.—The ledge in the Eagle tunnel has improved greatly during the week, and a large stream of water is flowing from the face. Some good ore is being taken out and the quality improving as the tunnel nears the Sweeney ravine.

Betty O'Neal.—The ledge in the south level of the Betty O'Neal has changed in appearance and is increasing in size. All indications are favorable for striking a large body of ore on this level. The stopes are looking well, and rich ore being extracted. A new feed pump is being placed in position.

ARIZONA.

Prince Rupert Mine.—*Citizen*, Feb. 21: The Prince Rupert mine, in the Wrightson district, owned by Messrs. Hughes & Lyons, is said to be quite a valuable property. The prospecting shaft is down about 80 ft on a vein 16 ft wide, a portion of which will average $300 per ton. Twenty-five tons of choice ore are now on the dump and will, on the completion of the railroad to Casa Blanca canyon, be shipped in Denver for reduction. It is the intention of the owners to sink another shaft about 100 yards westward of the one now down, and stope out the intervening ore. The high grade will be shipped and the inferior piled for reduction later on. The mine is easy of access and near to the line of the new road. Wood is abundant and water sufficient for all necessary purposes. On the whole, the mine is a very valuable one, and will eventually prove to be such to its fortunate owners.

Tombstone.—*Epitaph*, Feb. 26: The Ground Hog is one of the first locations made in the district by Ed. Schieffelin, the discoverer of the mines of Tombstone, and is in no wise inferior to his other locations that have made his name immortal, in connection with this, the best district in the United States. The main shaft is near the center of the claim and is down 35 ft. It shows a vein of rich horn silver ore from top to bottom, that assays from $200 to $2,000 per ton. The ledge has been uncovered for 150 ft south of this shaft and nearly 100 ft north, showing for 250 ft the same rich ore.

Girard.—The music of the stamps at this mine constantly reminds us that we have a new bullion producer in our midst. It is working quite as well as was expected, and will make a handsome record for the mine in the future. The first bullion shipment will be made on the 1st of the coming month

Tombstone M. & M. Co.—The 250 level in Goodenough is now well opened and looks remarkably well, as does also the same level in Tough Nut. The 100 level in Tough Nut is also looking and yielding well. There is no material change in the northwest workings. The Combination mine maintains its former prestige, both in quantity and quality of ore.

Old Guard.—This mine is developing rapidly and richly, and bids fair to be equal to any in that portion of the district. They continue to drift both north and south on the 150 level. The south drift is in 30 ft, with a 2-ft vein of good ore on the hanging wall, with rich bunches all through the ledge.

Contention Con.—Everything around these mines is working along with the usual smoothness, with the daily output of 75 tons of ore.

Vizina.—The drift running northward from the Sumner drift continues to show a large body of ore. The drift on the 400 level is now in 140 ft in length and entirely in porphyry and quartzite. The stopes in all parts are yielding their usual amount of ore, which goes forward to the mill. A dividend of $20,000 has been declared in New York, payable on the 1st proximo, which makes the total dividends to date $120,000.

COLORADO.

Mining Notes.—Denver *Journal of Commerce*, Feb. 18: The Caribou is shipping regularly.....Work has begun on the Big Chief mine.....A rich strike on Fryer Hill has been made within the past few days.....The ore taken out of the Ranchman, Clear creek, has paid for the development.....A lode above old Jimtown, Boulder, has been found that carries heavy lead ore.....The Henrietta mine, on Carbonate hill, struck a rich body of ore during the past week.....The Little Chief, recently located near the forks of the North Boulder creek, shows good ore at a depth of 15 ft.....The boys will be put to work soon on the Bonanza group of mines in Gold Lake central mining district, Boulder.....Cæsar Augustus, located near Balarat, has struck a solid inch of sylvanite running $45,000 per ton gold.....Work is about to be resumed on the Van Buren lode, Boulder. This property has a 10-inch pay streak averaging $180 per ton.....An assay of 24,390 ounces of silver per ton has been had at a 220 level of the Buxtes mine, Clear creek.....The Cosmopolite tunael, situated on Anglo-Saxon mountain Clear creek, is in 500 ft. In 100 ft more a rich lode will be tapped at a depth of 000 ft.

IDAHO.

Big Sale.—Idaho *Messenger*, Feb. 16: The group, known as the Freeman mines, has been sold to the Idaho M. Co., of Salmon river. The consideration was $490,000. This is by far the largest price paid for any piece of mining property in Lemhi county. When the season will permit of mining operations to commence we hope that the property will be put in such a state of development that it will be a permanent and dividend paying property. That Lemhi county has within its boundaries many rich mines has long been known to us, but the lack of means of communication with the outside world and the lack of capital for development have prevented the influx of capital. This period has now happily passed, the time when Idaho mines were at a discount is growing rapidly and beautifully less. The mining resources of our county have been but scarcely discovered, to a limited extent; and we are confident that the year 1882 will witness an era of discovery which the most sanguine of prospectors have not dreamed of.

The Ohio and Ornament Group.—Wood River *Miner*, Feb. 18: Of the many groups of mines tributary to this city, there are none more promising than the group owned and operated by the Ornament G. & S. M. Co. They are located about 8 miles west of Hailey, on Rock creek, and are easily accessible by way of a good wagon road. The most extensive hoisting works on the river were put up on these mines last fall, and 12 men have been steadily at work during the winter. One tunnel is in 180 ft, with an incline down 80 ft on the ledge. A perpendicular shaft is now being sunk, on which the hoisting works are used. The first crosscut from the 60 level in the main shaft exposes 20 ft of ore and ledge matter. A 3-compartment shaft is being sunk which will cut the ledge at 100 ft. The main shaft is now 120 ft, at which depth a level has been started. The ore is milling, and carries ruby, sulphates and native silver. One shipment of 15 tons returned 800 ounces silver to the ton. Fulton Haight, Esq., is superintendent of the Ohio and Ornament properties.

MONTANA.

The Moulton Pumps.—Butte *Miner*, Feb. 15: Yesterday the engine and machinery for the Cornish pumps were set in motion in the Moulton hoisting works. The enormous bob and fly-wheels moved with perfect precision and without sound. The machinery is so tremendous, and the motion so easy, as to amply repay the trouble of a visit to the works. The gearing is what is known as cut gearing, and the engine is now adjusted to an 8-ft stroke. Yesterday, in the Moulton mine, a new chute 3 ft wide, and of first rate ore, was struck on the west 200 level.

The Monoc.—During the past week four carloads of copper-silver ore have been shipped from the Modoc, each containing from 8 to 9 tons of ore. The shaft is now down about 175 ft, 100 ft of contract work having been done on it last summer.

The Belle of Butte and La Plata.—It was learned yesterday from "Uncle" Jack Downs that drifting is progressing steadily in both these mines, and that for the present no more sinking will done in either. There is a large quantity of ore above the present drifts, and as soon as they are far enough in to enable the management to sink a winze for ventilation, stoping will be begun in earnest. In the meanwhile both mines are looking well

Alice.—*Inter-Mountain*, Feb. 15: "Why," said Mr. Hall, "anyone who doubts that we have immense reserves of ore in the upper levels of the Alice has my permission to go down the shaft and examine the mine for himself. I am now going down myself; if you have time I shall be pleased to show you through." The invitation was accepted and Mr. Hall piloted the way through the 100, 200 and 300 levels. On the first are immense reserves of free ore. Some of it is low grade, but assays show it to be of good workable quality. The ledge is wide and the ore clean and compact. On the second level, also, an abundance of ore is in sight, somewhat more base than that of the level above, but yet susceptible of profitable reduction. In both the east and west levels the stopes have been by no means worked out and show thousands of tons of good ore. On the third level, at a point 100 ft east of the crosscut, a big winze has just been started on a body of base ore which measures fully 7 ft across and assays from 60 to 100 ounces per ton. Fifty ft further east is a stope which shows 9 ft of ore, some of it assaying as low as $33, but all of it rich enough to pay a handsome profit. In the face of the west drift, which is now being extended to a connection with the Moulton, good ore is being taken out and the width of the vein is constantly increasing. In the west drift on the north vein the stopes also show extensive bodies of ore.

Bitter Root.—Cor. Butte *Miner*, Feb. 18: The mines of this county (Missoula) are proving to be very rich. Work will be commenced on the Pleasant View, Monday, by Messrs. Bass & Abernethy. Operations were shut down on the 31st of Dec. last, and the mine was then reported played out; the shaft, which is 65 ft deep, soon filled with water so no one could contradict the statement, and on Feb. 6, 1882, Messrs. Bass & Abernethy bought the mine for $500. Upon examination the vein was found to be 4½ ft wide and to carry an ounce of silver to the pound of ore, or $2,200 per ton on an average The Bitter Root Prince is opening up finely. The vein is small, only 2 ft 8 inches wide, but very rich, assaying nearly $5,000 per ton. It is very easily worked, being free milling ore. There are over 200 locations at Sweat House on which nothing is being done, and which can be bought at a very small price. Many of these are fully as good as the claims now developed. The quartz in the Bitter Root country is undoubtedly the richest and most productive with the least work that I ever saw, and I am an experienced miner. We are surrounded by quartz on every side. Sweat House is 7 miles southwest of here. Willow Creek, 10 miles southeast; Woodchuck, 10 miles northeast; Lo Lo, 15 miles northwest, so you see we are in the center of an extensive mining country and are now awaiting further developments. There are over 2,500 locations in those four districts. Woodchuck, as far as developed, is shown to be a mineral mountain, mostly copper and silver. Specimens from the Belle mine show up very finely. Float has been found that carried 50 per cent. peacock copper; also, specimens have been found that carry 1,500 ounces of silver to the ton. Woodchuck is undoubtedly the richest camp here, but the Lo Lo is very nearly as good, only not having so many locations.

NEW MEXICO.

Mogollons.—Socorro *Miner*, Feb. 18: Everything quiet at the Mogollons. Messrs. Parker & Potter are taking out some ore from the mines they sold to Chicago parties, to be sent and tested. Work is being pushed on the Cooney mine, and new discoveries are encouraging. Sluicing on the Miller mine is stopped on account of water. At present there are only 30 men in camp, but they are hopeful and earnest. Snow is a foot deep in the mountains.

Lone Mountain.—A rich strike is reported from Lone Mountain this week. A force of men working on the Penacote mine, owned by W. P. Gibson and S. H. McAnish, last Monday uncovered a body of mineral 3 ft wide; assays run from 152 to 1,140 ounces; native silver can be seen in two well-defined walls 6 ft wide. These parties have secured the extension of the mine south, which is showing up well in sulphurets and gray copper.

The Campe.—*New Southwest*, Feb. 18: Mr. H. M. Meredith, who has just returned from a fortnight's tour among the mining camps, has kindly furnished us with the following items: Eureka district, about 30 miles south of Silver City, is opening out well for the spring work. The Massachusetts Con. Co. is working 50 to 75 men, and probably 200 more are working on their own account in this and Sunny Slope camp. The latter camp is showing up splendidly, with fine prospects of gold and silver. J. W. Knox is down 60 ft, and has struck a 5-ft vein of gold quartz assaying from $50 to $500 to the ton. Apache district lies about 18 miles northeast of Eureka. This is a new camp, and but little developed, but its prospects are bright. Victorio district lies half in Chihuahua, Mexico, and half in Grant county. Developments from 5 to 60 ft show carbonates of silver, with some gold. The outlook is good, but things are kept quiet, as if the property owners thought they had a good thing. Carrisalllo Springs is situated 40 miles east of Eureka. The district is being carefully prospected, but only one mine has been developed, belonging to Obed Foote, Jno. A. Miller and A. C. McComas. Two shafts, about 30 ft each, showed up well in silver.

Coal.—Socorro *Miner*, Feb. 23: Large bodies of coal of an excellent quality have been found near White Oaks, N. M. It is said to be better than the Trinidad coal. In what is known as Camp Edwards, on the Cuchillo Negro range, several new strikes have been made as high as 32 ounces in gold, and large bodies of gray copper have been uncovered. Mr. Will Bowlin, one of the owners of the Virginia copper lode, near South Fork, N. M., informs us that the mine has been bonded to John A. Miller, of Silver City, and W. L. Ryncreon, of Las Cruces, for $40,000.

Copper.—*Lone Star*, Feb. 19: Considerable excitement has been created here and in the Organs during the past week by reports of rich finds in the Jarilla mountains. These are a detached range of mountains situated in the plains, about 30 miles east of the Organs and about the same distance southwest from Dog canyon. The range is only about 12 miles long, and a man can almost walk around it in a day Some 30 miners from Lake valley and the Organs are now there, and others have come in and reported rich strikes. The ores are copper and argentiferous galena. A great drawback to prospecting is the absence of water. Prospectors must haul water from San Augustin. If, however, the mines turn out to be rich this difficulty will be surmounted in some way, no doubt.

OREGON.

Notes—*Sentinel*, Feb. 25: E. K. Anderson, of the '49 diggings, says that he has not done an hour's work in the mine this winter.....The Pacific Co. is pushing work on its ditch out of Wolf creek with 25 hands.....Capt. Kelly is making the dirt fly with his hydraulic pipe in the Coyote creek claim, and expects a rich clean up..... Sturgis & Bodmer are drifting on Jackass creek with a yield of $4 per day to the hand.... Green Bros. are working 8,000 quartz at the Sugar Pine ledge in Josephine county.....Cowaa & Gale are still picking up nuggets in the Birdsey claim, rented by them on Foot's creek .....The Applegate Gravel Co. are busy piping, with plenty of water.....Sterling ditch is cleaned out and ready for water, which is beginning to come.....Blue Gravel and English Co., on Calice creek, are working again with full head. Everything in the Willow Springs camp is in readiness and miners waiting anxiously for water.....T. L. Beck has sold his mining claim and ditches at Willow Springs to Messrs. Ingram & Dean, the consideration being somewhere in the neighborhood of $1,000.

UTAH.

Grand Gulch Mines Bonded.—Silver Reef *Miner*, Feb. 18: Mr. Edward Riley, of New York, has succeeded in bonding a controlling interest in the stock of the Grand Gulch Copper M. Co., at $2 per share, and the same is placed in escrow for 30 days; the balance of the stock is optional with holders at the same figures. This secures little short of giving away one of the most valuable copper properties known. If the sale is consummated, of which there can be no doubt, the new owners will soon demonstrate its true value. Messrs. Adams will be fully reimbursed for expenditures under their present lease, which will be relinquished.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

Eureka G. M. Co., Feb. 23. Capital stock, $10,000,000. Directors—Frank Shay, Jerome B. Brown, Fred Morris, Chas. E. Creen and J. E. Foulds.

San Francisco Pavement Co., Feb. 23. Capital stock $500,000. Directors—Frank Shay, Peter B. Quiolan, F. C. Siebe, H. B. Tichenor and T. W. Hinchman.

Winona M. Co., Feb. 25. Location, Antelope Neck, Sierra Co. Principal place of business, Sierraville. Capital stock, $500,000. Directors—E. L. Case, L. B. Keyes, T. S. Battelle, J. S. Ouynn, B Lemmon, J. A. Gleason, F. M. Rowland.

Quartz prospecting has broken out anew in Eastman gulch, a few miles above Lewiston on the Trinity river, and big results are liable to occur any day.

One hundred and fifty persons are reported to have been killed by an explosion in a coal mine at Leoben, Styria.

Comstock Inundation.

Source of the Gold Hill Water Flow.

On the 12th of this month the north drift on the 2800 level of the Exchequer mine encountered a large body of hot water. The water flow, in excess of the water which was then being pumped from the mine, has been variously estimated as being from 100 to 120 miners' inches in volume. Taking the latter figures as more nearly correct, the flow is equal to 1,500 gallons a minute, or 90,000 gallons an hour—no insignificant stream in itself. This water has since shown no abatement, and has so far exceeded the capacity of the pumps in that locality that it has risen in the Jacket shaft to a present point between the 2500 and 2600 levels, and has flown from the Yellow Jacket to the 2560 level of the Belcher, and thence to the 2275 level of the Overman, suspending prospecting operations in the Exchequer, Alpha, Con. Imperial, Yellow Jacket, Belcher, Crown Point and Overman mines. Notwithstanding Jacket's considerable pumping capacity (100 miners' inches per 24 hours), the water has gained steadily, although it is now believed that it will soon be under control. When the body of water was first struck in Exchequer, nine days ago, it was suggested that, inadvertently, the west wall had been cut, either by a diamond drill hole or by the drift. Subsequent inquiries, however, revealed the fact that no drill hole or drift in the Exchequer had been run within 200 ft. of the west wall. It has been further ascertained that a large body of quartz was encountered lying to the east of the regular footwall in an almost vertical position, and probably rising several hundred ft. above the 2800 level. Its existence in the Bullion and adjacent mines has long been suspected, and the fear of water alone has prevented prospecting along its supposed direction. The action of the water in the Yellow Jacket mine indicates that the bottom, or at least the lower portion of this quartz body, has been encountered. Ore bodies on the Comstock have mostly occurred in such outlying branch fissures, and the occurrence of bodies of water has often been revealed in such fissures. Many will remember the flow encountered in sinking the Con. Virginia shaft, which flooded the Latrobe tunnel for months. It is also fresh in the memory of Comstock miners that bodies of water were struck while developing the 1300, 1400 and 1500 levels of the Con. Virginia and California mines. It is a fact beyond dispute that with depth the Comstock ore bodies have increased in size and richness as their occurrence has been less frequent. From the surface to the 1,000 level eleven bodies of ore were encountered, yielding a net profit of $22,000,000; from the 1,000 level to the 2,000 level three bodies of ore were found, yielding about $100,000,000 net profit. With the increased size and richness of ore bodies an increase must also exist in the generative medium. Water being the medium acknowledged to have formed ore, its increased quantity must point to an increased size of ore bodies. It is possible that only one ore body will be found between the 2,000 and 3,000 levels of paying qualities, and it is quite possible that its first appearance has been indicated by encountering such an immense body of water in the north part of the Exchequer mine. The water encountered on the 2800 level will relieve the upper portion of the branch fissure, and that part above, after the water has found its level, will be dry. To demonstrate the existence of ore at this point a drift might be run from the lower levels of the Bullion mine east to intersect this fissure, the lower workings of the Bullion not being flooded and having no connection with any of the mines before mentioned. In the event of ore being encountered, a consolidation of the other mines could easily be effected for the purpose of draining the lower levels of the Jacket through the Bullion's new shaft, by placing in that shaft pumps capable of handling this flow of water.—*Virginia Chronicle.*

Chief Justice Waite's Great Mining Decision.

The United States Supreme Court, Chief Justice Waite delivering the opinion, recently laid down some fundamental principles in mining law, which merit the closest attention of those interested. There appears heretofore to have prevailed in many of our camps some very loose, and, in the light of the present decision, erroneous ideas regarding the legal definition of *possession, relocation* and *consequent rights.* The law is now laid down to be, that *possession* is the *right of possession* acquired under the acts of Congress and local laws and regulations. The possession must be actual until such laws and regulations are complied with, but thereafter and until a legal forfeiture occurs the right of possession is guaranteed to be an actual possession even against a peaceable entry. Any acts done in trespass of such presumed and legal right of possession, though peaceable, are declared to be "as if they never had been done." It is also decided "that a location to be effectual, must be valid at the time it is made," and "what has been once located under the law shall not be relocated until the first location has expired," which, being construed in effect, means that a strict regard must be paid to rights of prior locators, if any, and that jumpers will not be countenanced in asserting a title until they have lawfully acquired one. We quote: "The law fixes no time within a year when the work must be done. Consequently, if done any time during the year it is enough, and there can be no forfeiture until the entire year has gone by. * * * And the work, if completed on that day (Dec. 31), would be just as effectual for the protection of the claim as if it had been done on Jan. 1 previous." In short, the U. S. Supreme Court seems disposed to sit down on the "shot-gun" policy of holding mining claims, in favor of peaceable and lawful methods, deprecating, very properly, any legal construction that would "encourage unseemly contests * * which would be followed by breaches of the peace." A peaceable entry, however, on mineral lands, coupled with the right of possession, is declared to be an ouster of all other claimants. It is important to know, also, that territorial laws of limitation not in accordance with the laws of Congress are ineffectual, except for trespass in local courts, and must yield to the paramount interests of the United States when the question of title is concerned.

The Development of New Mexico.

This portion of the great West, almost unheard of a few years ago, is rapidly coming to the front as a rich and extensive mineral field. Mining excitement runs high, and new districts are being opened all over the Territory. Capital is coming in from the East; large sales are being made; bright, newsy and enterprising journals are published in nearly every mining camp, and the whole region is undergoing what may be termed a genuine mining boom. And what has brought all this about? The answer is given in one word—railroads. Before the advent of the iron horse, New Mexico was scarcely heard of, except in connection with her cattle and wool interests. But when the Atchison, Topeka & Santa Fe line penetrated the region, it threw off the lethargy which so long had bound it, and is, to-day, one of the most progressive Territories of the West.

Notwithstanding that the bullion product of New Mexico is insignificant, compared with Arizona, she has succeeded in interesting heavy capitalists in her mineral fields, and attracting the attention of mining men in the great centers of the East, and solely because she has rail facilities for comfortable travel and cheap and rapid transportation. We feel certain that northern Arizona has mineral beds equally extensive as our sister Territory. Without drawing any invidious comparisons, we can assert, as the opinion of miners and mineralogists, that the mineral belt of northern Arizona is second to no portion of the West. Its richness has been proven by the production of bullion under circumstances the most adverse. And, yet, while one dollar is being invested in this part of Arizona, one hundred are being invested in the mines of New Mexico. To a mining country railroads are a vital necessity. They are the arteries through which course the active life blood of its prosperity and advancement. Without them industrial death is its normal condition.

Arizona cannot have too many of them, and we hope to see the day when a network of iron bands shall cross our Territory from the line of Utah to the Sonora border.—*Arizona Democrat.*

BRISTOL.—The Bristol *News* says of the prospects of its camp: The prospects of Bristol becoming a good camp are certainly bright. We have many mines that can show magnificent bodies of ore uncovered, ready to be taken out and shipped to the reduction works. The Mayflower has enormous quantities of the precious metal running high in the hundreds. The Day has already two grand bodies of rich rock in sight, the extent of which has not yet been ascertained. The Tempest has a large quantity of good rock ready for shipment, as has the Iron mine. The Noonday is looking well, and promises to become one of the leading mines, while the Volcano can show a large and rich ledge. Besides these leading mines, there are several brilliant prospects, with wide ledges assaying very high. The character of the ore is mostly carbonates of different kinds, going about 60% in lead, and will consequently have to be run through furnaces. These mines are on the same mountain range as Piocbe, and though the rock is different in being smelting instead of milling, as the Meadow Valley and Raymond & Ely ores are, there is no reason why Bristol should not loom up to be as wonderful a camp as was Piocbe in its palmy days.

A CREATURE OF ENDURING WEALTH.—The great results achieved through the mining industry are daily becoming more apparent. It not only builds and peoples the waste and desert places, and adds a real, indestructible stream of wealth to the treasury of the nation, but also quickens and vitalizes the forces and powers, and strengthens the foundation of every other business enterprise of the country. Capital is the nation's right arm of power, and the bulwark of strength and security in the time of war or peace, and mining furnishes this most directly and rapidly. This producing force is strengthened by its own growth and development. Let a double yield be gathered from the grain fields of the country, and prices fall; but let our mines throw a double portion of their products into the arteries of trade and values increase in every department of business activity. Mining, true and legitimate, is the creation of enduring wealth, and its success, when developed as business, will touch and quicken with its vitalizing force the sluggish pulse of every human activity to the remotest bounds of civilization.—*Silver Reef Miner.*

Patent Business.

Patents Are Virtually Contracts

Between inventors and the public. The consideration flowing from both parties to the contract is expressly fixed by statute. The Government requires the following consideration in every case: First, that an applicant for a patent shall disclose a new and useful improvement, of which he is the first and original inventor. Second, that the invention has not been patented, or published in a printed publication, prior to the date of his *invention.* Third, that the invention has not been in public use, or on sale, more than two years prior to his application for a patent. Fourth, that the invention shall be properly described and claimed in the specification forming a part of the patent. Provided an inventor complies strictly with these conditions, the Government guarantees that the inventor shall have the exclusive right to make, use and sell the thing invented for the term of 17 years.

The Patent Law provides that in case a patent, which is the evidence of the contract, is not executed in compliance with the requirements of the law, it may be annulled and rendered void. Hence, it is of the greatest importance to every inventor that his patent or contract be skillfully and accurately drafted, that it may afford him complete protection for his invention during the life of his patent.

Secure a Good Patent.

An inventor should first ascertain whether or not his improvement has been patented to another. This requires an exhaustive search among all the patents in the class to which the invention relates. This question can often be answered gratuitously by us immediately on receiving full information of the invention, by reason of our long and extensive practice as patent solicitors and editors and publishers of first-class scientific and industrial journals during the past 20 years and over. When the question of priority of invention is not so readily to be determined, it is generally best to make what is termed a "preliminary examination," by searching through the patent office reports among the patents in the class to which the invention relates, and referring to our extensive patent library, containing compilations of special classes of American and foreign inventions, mechanical dictionaries, scientific encyclopedias, files of scientific and mechanical newspapers, and an immense number of patent applications by inventors of the Pacific coast, carefully filed by this office since 1860.

If, by this "preliminary examination," the improvement is found to have been previously invented, our client will receive for the small fee of $5 for the examination a verbal or written report showing definitely whereby his invention has been anticipated, thereby saving him further expense, and perhaps much time, useless delay, anxiety, etc. When the invention is found to be patentable, the fee for preliminary examination is applied toward the payment of the remaining fees, so that a preliminary examination by us really costs the inventor nothing extra if an application for a patent is finally made.

To avoid all unnecessary delay, however, in securing patents at the earliest moment practicable, inventors will do well to forward a model, drawing, or sketch, with a plain, full and comprehensive description of their invention (stating distinctly what the particular points of improvement are), with $15 as a first installment of fees. A preliminary examination will then be immediately made, and if the invention is found in an earlier patent, we will return $10 to the inventor, and retain $5 for services. If, on the other hand, the improvement is deemed to be novel and patentable, the necessary papers for an application for a patent will be prepared immediately, and forwarded to the inventor for his signature. When the inventor receives the application and finds it duly prepared, he will carefully sign and return the same plainly addressed to us, with postal money order or express receipt for the balance ($25 or upwards) of our own and the first fee of the Government. The case will then be promptly filed by us in the Patent Office, and vigorously prosecuted to secure the best patent possible. [This course is the most expeditious and satisfactory, as no time is lost in transmitting correspondence relative to the preliminary steps to be taken.] When the patent is allowed, the inventor will be duly notified, and on sending the final Government fee of $20 to us, we will order the issue of the patent, and forward the same as soon as it is secured from the Patent Office.

When the invention consists of a new article of manufacture, or a new composition, samples of the separate ingredients sufficient to make the experiment, and also of the manufactured article itself must be furnished.

Models and Drawings.

Models are now seldom required by the Commissioner of Patents, and generally only in intricate cases. Perfect drawings of practical working machines are considered more satisfactory to the Patent Office than the old and more cumbersome system of storing up an immense bulk of almost numberless models.

Drawings or sketches sufficient to illustrate clearly the invention, with a sufficient description to enable us to make a full set of perfect drawings for the Patent Office is all that we require. A model will answer our purpose as well, however, in cases where the inventor can more easily furnish it for our use.

The value and even the validity of a patent often depends on the character, clearness and sufficiency of its drawings. There are thousands of existing patents in which the improvements are but partially or very poorly illustrated in the drawings. When an attempt is made to dispose of such patents, the vagueness and defects of the drawings often prejudice capitalists and manufacturers against the invention, while in reality it may be of great value, and would meet with ready sales had the invention been fully portrayed by artistic and skillfully executed drawings. Again, when patents of this character are brought into court, the uncertainty and ambiguity of the drawings enable the opposing experts to mystify the judges as to the construction or combination of parts intended to be covered by the patentee. In all cases prepared by us, the drawings are made under our personal supervision, by skilled draftsmen in our constant employ, and every precaution is taken that the invention is fully and clearly shown by different views, so that the improvement will be readily understood by the Examiners in the Patent Office, and comprehended by the public when the patent is granted.

In the Patent Office

The application is assigned to the Examiner having charge of the class to which the invention relates. The case must then take its turn with others in the order of filing, and in due time is carefully examined to test the novelty of the invention. If the Examiner fails to find anything that anticipates the invention, a patent is immediately allowed, provided the specification and claims are drafted in proper form. Should the Examiner find a prior patent which, in his opinion, anticipates one or more of the claims the application, a letter of rejection is sent to the attorney in charge of the case; and if the attorney coincides with the views of the Examiner, the claims rejected are erased. In preparing applications for patents, an attorney should be careful to familiarize himself with the class of inventions to which the application pertains, so that the specification and claims may be drafted as nearly perfect in the first instance as is possible. This course saves much time in prosecuting the application to a patent.

When claims are improperly rejected on patents which do not anticipate the spirit or wording of the claims, proper steps are immediately taken to convince the Examiner of his error. This is done, in most part, by personal arguments, as the differences in construction, operation, function and results are more readily discovered and appreciated by an oral presentation of the facts than can possibly be done by relying solely on written arguments. In order that the Patent Office record of the patent shall be complete, an oral argument is generally supplemented by a manuscript brief, that others, in examining the files at any future time, may clearly comprehend the position taken by the Examiner and attorney in prosecuting the case to patent.

In addition to our own personal attention to the interests of our clients here, we have, for over 12 years past, had constantly in association with us in Washington, one of the soundest legal counselors and ablest of practitioners in patent business in this country, who carefully attends in person to our business at the Patent Office and has attained success in a most marked degree.

Perfect Claims.

The value and force of a patent are dependent on its claims. A patent may disclose to the public the most important and valuable invention, and yet the claim be of such meager scope that the patent is actually worthless. When the claims of a patent are so loosely drafted that infringers can flood the market with improvements, differing from the improvement disclosed by the patent only in slight changes in construction and arrangements of parts, such a patent is valueless to the owner, as it fails to afford him that exclusive and complete protection guaranteed by the Patent Law. Hence it is that the greatest care, skill and perseverance are required, first in properly drafting the claims in the first instance, and, second, in prosecuting the application before the Patent Office, and maintaining the rights of the inventor to claims as broad and sweeping as the invention will warrant. This latter is no easy task. The Examiners of the Patent Office serve in the capacity of attorneys guarding the interests of the public. It is their sworn duty to exercise the greatest care and watchfulness, that patentees do not secure claims of greater scope than they are justly entitled to. It is but natural that Examiners are sometimes in error as to just what scope should be accredited an invention. Although the Examiners act under honest convictions in cases where they refuse an inventor his just rights, yet it is the duty of the attorney to maintain the claims of his client, if he is convinced that they are just and proper. To succeed in this requires the display of tact, firmness and ability; and when the Examiner is made to see that the inventor is honestly and fairly entitled to the claims which have been rejected, he will almost invariably recede from his former action, and allow the case.

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Inventors on this coast will find that owing to our familiarity with inventions and local affairs of this coast, we can more readily and fully comprehend their wants, and thus save much of the time ordinarily consumed in preliminary writing back and forth when distant agencies are employed.

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A Caveat is a confidential communication made to the Patent Office, and is therefore filed within its secret archives. The privilege secured under a caveat is, that it entitles the caveator to receive notice, for a period of one year, of any application for a patent subsequently filed, and which is adjudged to be novel, and is likely to interfere with the invention described in the caveat, and the caveator is then required to complete his application for a patent within three months from the date of said notice. Caveat papers should be very carefully prepared. Our fee for the service varies from $10 to $20. The Government fee is $10 additional.

To enable us to prepare caveat papers, we only require a sketch and description of the invention

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Inventors who have rejected cases (prepared either by themselves, or for them by other agents), who desire to ascertain their prospects of success by further efforts, are invited to avail themselves of our unrivaled facilities for securing favorable results. We have been successful in securing Letters Patent in many previously abandoned cases. Our terms are always reasonable.

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GEO. H. STRONG. W. B. EWER. A. T. DEWEY.

The Engineer.

Electricity as a Motive Power.

The development of electricity as a motive power is an aim which, though difficult of realization is yet strongly to be desired. Its achievement is not, however, so very far off, if we may take the utterances of some of the best authorities on the subject as conclusive evidence of the probabilities of the future. For example, M. Bontoux, presiding last week at a meeting of the Parisian Society for the Utilization of Electric Force, observed that the artisan who needs a little motive power for his work, is forced to seek it in the employer's factory, while the thousands of workmen and workwomen wear out their bodies and destroy their strength in impelling the sewing machine, the lathe, and the other motive powers of small industry. The division of electric energy is destined to effect an entire revolution in this sphere. The day will come, and sooner than is imagined, when the artisan family will soe enter their dwelling by means of a magic wire the force which is now so costly to them, and this will be the democratization of force in the benefit of the working class. The solution of the question of motive force for mechanical industries is by this apparently not far distant, and it is curious to contemplate the changes in our social and public arrangements which such a development of the electric motor would accomplish. If an efficient, actuating agent for small machines of every kind could be readily obtained and cheaply purchased, what a revolution would come over the existing labor market. How many workshops for men and work-rooms for women would be closed, the quondam employes being supplied in their homes with the means of carrying on their work in their own apartments. Without attempting to foreshadow all that might happen, certain it is that the cost of driving lathes and machines of every kind would be largely diminished, and the means and motive for extending their application supplied. From all points of view it is much to be wished that this novel mode of actuating machinery may be developed so that its efficiency and economy may establish a reputation, and be largely patronized by both large and small employers of labor.—*Building and Engineering Times.*

Underground Telegraph Wires. — The present much mooted subject of underground telegraph wires is by no means a new one; neither are the practical difficulties attending such a system new. The first telegraph line ever constructed—that from Baltimore to Washington—was first laid underground, but it could not be made to work until it was placed upon poles as at present. Telegraph builders have ever since been trying to devise some means by which the current can be made to work as well underground as above. As yet, however, the problem is not considered fully solved, although in some parts of Europe sufficient progress has been made to introduce underground telegraphy to quite a considerable extent. Extensive experiments in this direction are also now being made in the United States.

Ancient Schemes for Isthmus Canals.—A Spaniard named Zaragoza has been writing for the Geographical Society of Madrid a series of articles on ancient schemes for building canals across Central America, connecting the Atlantic with the Pacific. It appears that so early as the 16th century, the Spaniards had selected three places in that country for canals. They were by way of the Isthmus of Tehauntepec, in New Spain, now Mexico, the river San Juan, or the lake of Nicaragua, the Chagres river, and other parts of Panama. The first scheme, he says, was abandoned, to be mooted again in the present century; those of Nicaragua were actively pursued in the 17th century, and were on the point of being executed.

The Weight of the Brooklyn Bridge.—In a recent report in regard to the weight and carrying power of the East River bridge, Engineer Roebling said that the aggregate strength of the cables is 12,300 tons, and the elastic limit is 8,200 tons. The floor beams in the superstructure will sustain 140 tons each. The total weight of the bridge, with its transmitting load, is 17,780 tons; weight of main span, loaded, 8,120 tons, of which the cables and the long stays support 6,920 tons, and the trusses and short stays, 1,180 tons. The reason assigned for increasing the hight of the trueses was, that the bridge should be used for every purpose to which it would lend itself.

The *Engineer* states, on the authority of a German journal, that there is a scientific reason why green or brown bottles are preferable to bottles of colorless glass for holding liquors. A disagreeable taste is acquired by liquors put into white bottles, which the same liquors are wholly free from when kept in bottles colored green or brown. Blue and violet bottles are stated to be as objectionable as white ones in the respect mentioned.

Bill Williams' Fork.—The copper properties along the fork are beginning to attract the attention of capitalists. There is a lively demand for copper, and experts are constantly in the field searching for that mineral in the interest of would-be investors.—*Yuma Free Press.*

Useful Information.

A New Use for Cotton.

That there is a new era dawning upon the South, so far as manufacture is concerned, will be conceded by every practical business man of intelligence. All over the Southern States there are numerous streams with ample power for manufacturing purposes. These streams never freeze, nor do they dry up, droughts being less frequent here than in the north. Labor is cheaper in the South, because living is cheaper. Houses cost less, food less and fuel much less, from the fact that not much more than one-half is used. In addition to these advantages, and hundreds of others that might be mentioned, it is not amiss to say that in Georgia cotton and woolen mills are, by an act of the Legislature, exempt from taxation for 10 years from the time of their erection. There is not a single use to which we can put the fleecy staple on our shores but what saves transportation and adds so much wealth to the country.

These thoughts are suggested by a New Orleans exchange, which states that Mr. Thos. H. Dunham, a rope maker of Boston of 40 years' experience, states that over 150 tons of hemp rope is made in the United States daily, and that the hemp is mostly imported. He also says that the cotton fiber is preferable, and that cotton rope can be made for 50% less than hemp rope, and that cotton rope is better for all shipping uses, cables, bolt rope, halliards, tow ropes, hawsers, tackle and falls, hoisting, etc. For caulking, he holds that it is superior to hemp, and believes that it can be used for roofing, and instead of duck, and as a substitute for leather and rubber in hose and belting, and for tubing to enclose telegraph wire and telephone wire, both overhead and underground. In fact, if all that Mr. Dunham claims for cotton is hereafter justified by practical use, the great staple will possess a value incalculable.

That this new use for cotton can be made a profitable manufacture there is little question. Congress has authorized the Secretary of the Navy to introduce cotton cordage into the naval service of the United States, to such an extent as will furnish a fair test of its value and efficiency as compared with the kinds now in use. The bill, which originated in the Senate, was reported from the house committee on naval affairs by Judge Elam, of Louisiana. There are many considerations in favor of the experiment. The North has supplied the navy with cordage for over 50 years, and the introduction of cotton will give the South a chance to share in the manufacture. Besides, the production of the fiber at home will make the country more independent of foreign sources of supply. Tar, one of the materials used, is also a Southern production. Russia and Manilla hemp should not be imported into this country. We can raise hemp ourselves, and we can substitute other fibers and be less dependent. This is the true principle of national greatness, of Southern prosperity, and of individual plantation success —never buy what you can produce.—*The Tradesman.*

Pine Oil.—A. M. Stanley, of Wilmington, N. C., has discovered that there is literally such a thing as "fat pine," and has invented a machine with which to make pine oil from slabs and other piney refuse from mills. He claims that one cord of light wood will yield 80 gallons of pine oil, worth, at manufacturers' prices, 25 cents per gallon; also, that this cord of wood will net $20. He not only gets the oil, but also 50 bushels of charcoal, which he readily sells at 10 cents per bushel; also, 100 gallons of pyroligneous acid, and 50 lbs. of vegetable asphaltum, making a fine black varnish. The pine oil, which is the principal yield, contains a large percentage of creosote, and has been found to be one of the best preservatives of wood known, protecting it from the attacks of insects and worms, particularly from the teredo, or salt-water worm, which destroys all the piling underneath wharves along the sea coast. If Mr. Stanley's undertaking is a success, he has a fortune at hand. The yearly waste in our pine forests is immense, and if it could be utilized as this invention would indicate, mill refuse could be turned into great profit.

Visual Phenomena.—It is well known that a black object on a white ground will appear to be much larger than it really is. A white stripe, for instance, on a black surface seems broader than a black stripe on a white surface, although both be of the same width. This phenomenon of simultaneous contrast is physiologically explained by Peter Scherffer in this way: When one of our senses receives a double sensation, one of which is active and strong while the other is weak, it will be found that the latter is not felt. This must be particularly the case when both impressions are of the same kind, or when a strong effect from an object on one of the senses is followed by another of the same kind which is milder and weaker.

A Good Dessert for a Change.—Make nice short dough like pie-crust, roll quite thin, sprinkle on some thinly-sliced cooking apples, roll up not too tight, wrap in a thin clean cloth, tie rather loosely, and steam for nearly an hour and a half. Serve with wine sauce or cream and sugar, as you like best. Mix a pinch of soda in the flour thoroughly before the shortening.

Dyeing Leather Gloves.

A new and easy method for dyeing ordinary leather gloves violet, black or yellow is given by the *Moniteur Industriel.* The gloves are first cleaned from all greasy matter by a warm but weak solution of sal soda; they are left in this alkaline bath for about 45 minutes, are then taken out, washed, rinsed and pressed out. The gloves, thus cleansed, are put in their original shape again and *well stretched*, after which they are ready to be dyed.

Dyeing violet. Either aniline violet, or archil can be used, according to the desired shade.

1. The color is applied by means of a brush or a piece of cloth, which is saturated with the coloring matter.

2. The gloves receive, after the first treatment with the coloring matter, several coats of an alum solution, after which they are dried, and after this one or two coats of coloring matter. The coloring solution should be applied warm.

3. Before the gloves are perfectly dry, they are polished with cloth cushions, wrapped up in fine linen, which is the best way to produce the grain.

Dyeing black. The same means are used as above, and all the manipulations can be used. (The coloring matter is the same that is commonly taken for blacks).

Dyeing yellow. This requires less complicated manipulations. A decoction of Persian berries is used with the addition of some alum. Several coats are required, after which the gloves are polished in the same manner as above described.

Asbestos Paint and Fabric.—Some interesting tests have lately been made in England of the value of asbestos paint applied to wood, canvas and other combustible materials. Among other experiments, a piece of light pine wood, about six inches long by four inches square, painted with five coats, was placed for upwards of half an hour in an ordinary grate fire, but, although the wood within was reduced to charcoal, there was no blaze whatever emitted during the charring. A small model theater, built of wood, with net scenes and accessories, was sprinkled with turpentine and set on fire. Every portion ignited and the whole was consumed. A similar model, with the net scenes and the wood framing all painted with asbestos, was drenched with turpentine and set fire to, but the thin scenes were only partially charred at the lower ends with the turpentine flames, while the timbering was not even ignited. Similar illustrations were made with two models of larger size, about four ft. cube, built on a bed-plate of one-inch deal board, and set fire to by a bundle of shavings. The one was burned and the bed-plate set on fire. In the other case, where the framing scenes and the bed-plate had been painted with asbestos, no ignition was effected, and, although the lower portions of the light scenes were destroyed by the fierce flames of the shavings, the rest remained intact.

Good Health.

Drinking Water as a Source of Disease.

I cannot go further into the consideration of these circumstances; I only cite them as evidence of the influence of moisture in the soil so far as it is measurable by the proportion of ground water present. We are more nearly concerned with the relation of the soil to the water which we apply to our own use, which we draw from wells and springs, to water as a vehicle conveying matters out from the soil. When typhus or cholera rages epidemically in any place, two parties immediately set up a contention as to whether the epidemic influence proceeds from the water or the air. It must be admitted henceforth that either is possible, that a so-called sickly soil can impart its noxious properties equally to the water and to the air it contains, but it may also be that only one of these ways is possible as to certain matters and lower organisms. Observation and experiment must decide upon that. Most physicians have hitherto considered that infection was probably most directly conveyed through the water, and the so-called drinking-water theory has been developed from this view. It has, however, been ascertained that the best known infectious agent in the soil, the *Bacillus malariæ*, which Klebs and Tommasi-Crudelli have discovered and studied in the Roman fever districts, cannot live without air. These investigators found that the malarial poison was not communicated to the water that stood over a richly malarious mud. Tommasi says, in his latest work on the Roman malaria and the ancient drainage of the Roman hills, that "the *Bacillus malariæ* is preeminently an air-living organism." Among the conditions favorable to its propagation in a malarial soil—which need not be a swamp soil—Tommasi specifies a temperature of about 20° C. (68° Fahr.), a moderate degree of steady moisture, and the direct action of the oxygen of the air on all parts of the mass. He says further: "The lack of one of these conditions is enough to cause a suspension of the development of the spores and of the increase of the malarial ferment." If anyone, however, believes that this organism must also remain inoperative when it passes into our blood because that is a fluid, he should be reminded that it makes a great difference whether we put such organisms, taken from their airy nests in a moist soil, into cold water, or into warm blood where air is supplied to them from the corpuscles.

We cannot, indeed, answer, with the results of experiment and microscopical investigation, questions respecting the infectious diseases with the specific germs of which we are not acquainted, but we may be guided in the matter by other facts. Naegelli says: "Contagion fungi can keep up their peculiar activity in water only for a short time. The purer it is, the less food they find in it; they are very soon removed by exhaustion in clear spring water; and, even in water that contains food for them and where they can multiply fast, degeneration quickly sets in, and they are changed into common ferments."—"*Sanitary Relations of the Soil,*" *in Popular Science Monthly.*

Simple Remedy for Catarrh and Bronchitis.

It is now generally known that carbolic acid is strongly disinfectant, and very usefully applied to putrid sores or purulent wounds. Wood *creosote* is similar, is decidedly antiseptic, and quite volatile. It is, therefore, natural to suppose it would be useful when applied to catarrhal and bronchial affections which arise from diseased or putrifying mucus. We learned of its use for this purpose from Dr. Peecetto, a leading physician in the noted Italian medical school in Genoa, Italy, from whose conversation we gleaned portions of the important article on "Catching Cold and the Remedies," given in last December's *American Agriculturist.* We have since recommended the following treatment in many cases with the best results. It can do no harm, is simple and is eminently worthy of trial, both for temporary and chronic affections:

For bronchitis: Get from the druggist's a little good wood creosote. Put two drops of it into a bottle holding a pint or so. Pour in a little more than half a pint of clear water, and shake it well; also, shake well always before using it. Take a mouthful of this, throw the head back, gargle it some time in the throat, and then swallow it. Repeat this every two hours, more or less, so as to use up the liquid within 24 hours. For each subsequent 24 hours use three drops of the creosote in three to four gills of water. This three drops a day may be continued as long as any bronchitis appears. Two or four days is usually enough, though it may be continued indefinitely without harm.

For catarrh: Prepare the creosote water as above, to any amount, at the rate of one drop of creosote to one gill of water (four drops to the pint), or a little more water if the creosote be very strong and the water too irritating. Make a fresh mixture once in two or three days and as much oftener as more is needed. Take a handful of this water, previously well shaken, and snuff it through the nose into the mouth and eject it. A little going down the throat will do no harm. Do this two or three times and repeat it at bed time, in the morning on rising, and, if need be, occasionally during the day. In fact, keep the nasal passages washed out with the creosote water. Its vapor will even penetrate the bony cavities, and also be drawn into the lungs with useful results. It destroys the purulent mucus, and tends to prevent its further secretion. It is useful for any discharges from the nose or lungs produced by colds or general weakness.

Women's Health.—"I would," says Gail Hamilton, "that women were happier." The wish meets an evident need, but if Gail had gone to the root of the matter she would have said "I would that women were healthier." It has come to be a commonplace truism that health holds, in itself, the secret of all life's success, but its full significance has never yet been adequately appreciated. Women are too apt to regard the measure of health as met if they are not actually ill. Now, true health is a positive, rather than a negative, state. It is physical exhilaration; it is the state when duty becomes delight, when the surplus energy craves exertion. In this state the keen morning air is like wine, and life takes on a rest, a glow, a sparkle. This is the physical state that renders possible mental enthusiasm, spiritual exaltations. "I'm so nervous," sighs a woman whose life is set in the midst of all comforts and perhaps luxuries. But wherefore? What need is there in being "so nervous," when exercise, sleep, proper food are attainable? "A woman of 20 ought to be as much ashamed of being dyspeptic as of being drunk," severely says the scintillating Gail, and it is true, even if severe. If women can once become regenerated with the fact that a state of vigorous, robust health is quite compatible with intellectual power and refinement, and being only negatively well is not necessarily synonymous with a lady, it will do more for women's advancement than all the ballots she could cast between Boston and San Francisco. Probably, however, she requires the discipline of political enfranchisement to educate her up to wider views of life and its possibilities and deep significance.

Walker Lake District.—Owing to the presence of a superabundance of the "beautiful," only a few claims are at present being worked in this district, which is situated on the south-east side of Mt. Grant, Nev. However, some good prospects are found, and as soon as the snow goes off considerable prospecting will be done.

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SAN FRANCISCO:

Saturday Morning, March 4, 1882.

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Passing Events.

The argument in the great slickens case began this week before Judge Jackson Temple, at Sacramento. We give in another column a brief note of Mr. Cadwalader's argument. It will not be long now before a decision is given in this most important case. Doubtless, however, it will have to come before the Supreme Court of the United States before final adjudication.

The week has been rendered a notable one in public affairs by the formal tribute paid to the memory of President Garfield by the people of the United States, through their representatives in Congress assembled. The eulogy by ex-Senator Blaine was a calm analysis of the life and eminent services of the murdered President, supplemented by a glowing tribute to his memory, which will find echoes in the hearts of fifty millions of people, who delight to honor his name.

The Governor of this State this week issued a proclamation declaring Saturday, the 4th inst., a legal holiday, the occasion being one when the people will hold mass meetings in different cities and towns and express their views in favor of restricting Chinese immigration. It is intended to impress Congress with the unanimity of the people of this coast on the subject.

A COMSTOCK miner writes to the Virginia *Chronicle*, complaining of the exortionate prices asked for fuel in that city. His monthly housekeeping expenses for himself, wife and three children amounted to $90, of which $28.75 was paid for wood and coal.

FOSSIL remains of animals and fish have been found by a hunting party on the ranch of Mrs. Emily Knot, about 10 miles from Redwood City, on a hilltop nearly 1500 ft. above the sea level.

THE snow is quite deep at Jefferson and surrounding mountains.

Working Slimes and Tailings.

The mode of reduction of slimes and tailings has been improved and economized to so great an extent by the tailings mills, as to allow of the treatment of material which a few years ago was considered worthless. The tailings which the tailings mills on the Carson river work, and which were, in time gone by, produced from Comstock ore, were collected in reservoirs at the various mills, and also in larger quantities on the flats at the outlets of Dana, Gold and Six Mile canyons. Not an unimportant factor in the economy of working these tailings is the low price of quicksilver; nor can the discount on silver bullion be lost sight of. A material change in the price of either might cause an entire suspension of the industry. This fact shows how closely everything is figured down and how small a margin one way or the other causes profit or loss.

The expression "tailing" is generally made to include the slimes or battery overflows, which are by far richer than the tailings proper or pan residues. The slimes settle in the portions of the reservoire least subjected to water currents. In an amalgamating pan the slimes form a pasty mass, which has a tendency to hold the quicksilver suspended and carry it off. To obviate this, sand is added, generally one half, and sometimes twice the quantity. It depends upon the amount of calcareous mineral present. The charges thus prepared do not, as a general thing, assay more than $6 per ton. Mr. J. E. Gignoux, superintendent of the Lyon M. & M. Co., gives to the Director of the Mint a description of the method of working these slimes and tailings, as follows:

The treatment is termed base, as from 15 to 20 lbs. of copper sulphate to the ton is usual. This copper is reclaimed in a great measure by the subsequent refining operation. The process is more successful when the amalgam is not finer than 200. The pans are generally wooden and of two and four tons capacity. Charges are made every four hours. Salt, copper and quicksilver are added at the commencement of the operation, when steam is also given. Simple mullers are used, as no grinding is required. The settlers are of a sufficient size to allow the charge to be diluted with water until quicksilver particles will no longer remain suspended. The charge is kept in motion in the settler for four hours, or until the next pan charge is to be drawn; there being a settler for each pan. The quicksilver is obtained from bowls, which are connected by pipes with the settler bottoms, is strained directly and retorted in large retorts of the usual form. These are gradually heated for about 12 hours. The gold, copper and what foreign matter was present in the amalgam form a spongy mass, which is easily separated from the silver, which forms a compact scale next to the iron of the retorts. By a mechanical separation base and white metal are obtained. These are separately treated, although the refining operation undergone is precisely the same in both cases. The bullion is broken into lumps about the size of an egg and thrown into a moderately heated one-hearth reverberatory furnace. Here it remains several hours, when the metal oxidizes to a certain extent and becomes sufficiently brittle to allow of crushing and passing through a fine sieve. It is then divided into charges and submitted to an oxidizing flame in the furnace, constant stirring being required. The roasted mass is then treated in a bath of sulphuric acid. The copper is taken up as a sulphate of oxide of copper, also a small portion of silver. This is precipitated by metallic copper in the form of fine silver, which is filtered and washed, and when melted is about 999 fine. The residue from treatment of the white metal gives bullion about 985 fine, while the base contains the gold. The liquor from the bath, subsequent to the precipitation of silver with copper, is conducted into tubs and allowed to crystallize into commercial bluestone.

To show the cost of extraction, net yield, etc., in working these slimes and tailings on a large scale we give the following statement taken from the County Auditor's books, of Lyon county, where each company is required by law to file a sworn statement for assessment purposes:

NAME OF COMPANY.	Number of Tons Extracted.	Value per Ton.	Gross Yield.	Cost of Extraction.	Net Yield.
Pacific Mill Company	12,150	$12.47	$149,644.15	$83,856.00	$65,788.15
Union Mill Company	7,155	3.89	27,846.81	19,545.49	8,301.32
Lyon M & M Company	35,329	3.58	128,177.00	116,555.55	11,621.45
Woodworth Mill Co...	11,518	5.53	47,154.12	48,515.38	.....
French Mill	1,560	8.09	12,625.12	2,720.00	9,905.12
Atlanta Mill Company	4,580	3.21	18,929.24	16,905.00	2,024 24
Eureka Mill.....		3.23	8,339.73	5,336.85	2,662 88

The foregoing statement covers four quarters.

MR. B. W. CROWELL, our corresponding agent, will soon visit portions of Santa Clara, Santa Cruz, San Benito and Monterey counties on his route southward in the interest of this paper.

THE Late strike made in one of the Southwestern Company's mines at El Dorado Canyon is reported as turning out handsomely and the hopes of the most sanguine are realized.

Foundry Notes.

The Oakland Iron Works.

It seems somewhat strange that a city, the second in size on the Pacific coast, should have been all these years without a foundry, yet such is the fact. A machine-shop or two, with the blacksmith shops, have comprised all the iron-working industries of Oakland. For the simplest castings people have had to send to San Francisco. The nearness of the great foundries of the city has, therefore, kept back the growth of any very flourishing iron industry in Oakland.

Now, however, Oakland is to have an iron foundry of her own. Ives Scovills, of the Oakland Iron Works, has nearly completed a new building, 100 ft. front on Jefferson and 60 ft. on Second street. The building on the old lot will also be moved up and will thus give the new works a frontage of 100 ft. on each street. The buildings are two stories in hight.

The foundry proper is 60 ft. by 31½ in the rear of the building. At the time of our visit this week the floor was being put in. A traveling carriage, moved by rack and pinion, is for the present to be used instead of a crane. The hoisting gear on the crane carriage will be run by chain wheel from the floor.

The cupola is of medium size, and will be lined up 24 inches. They will be able to take off about 7,500 weight to a heat, for a cast which will require that much. They have a core oven six ft. wide and 20 ft. long, arranged so that the surplus heat from the boiler passes through it, this heat being thus utilized for baking the cores. They expect to be ready to take off a heat in about two weeks, if the weather permits their getting in their floor all right.

Mr. Scoville expects to be able to do all kinds of work, mining machinery, stone breakers, etc., included. The facilities for shipping are good, the railroad passing within a block of the works, and there is a side track there which can be used on occasion.

The old shop is at present busy in fitting out the new one, making an engine or two, and doing repair work and small jobs. Mr. Scoville says, that hereafter people will have no excuse to go to San Francisco for iron work. He has labored under great disadvantages, since in doing jobs, he has been himself compelled to go to the city for any castings, however small. With the convenience offered by the cupola, the enlarged premises and the increased facilities, these works will no doubt get some of the transient trade, as well as their regular line.

Heretofore they have been unable to do any mining machinery work at all, because they could make no castings. Now they propose to compete in this direction, and extend their business. The machinery, tools, etc., of the old shop will be transferred to the new one as soon as the buildings, now nearly completed, are ready for occupancy.

New Quartz Crusher.

Charles P. Stanford, of this city, has just patented through the MINING AND SCIENTIFIC PRESS Patent Agency, a peculiarly operating quartz crushing device. A circular flat-bottomed mortar is secured properly to a foundation or mortar block, and provided with screens. Within this crusher is the mortar or pestle. This consists of a heavy metal block, having peripheral dies upon its under surface, bolted or keyed to it. The mortar is large enough to easily contain the pestle and allow it considerable side play.

The frame of the device has cross guides, in which a vertical shaft is journaled and properly supported. This shaft has secured to it a crank arm, through the outer end of which the stem or handle extending upward from the pestle loosely passes.

The shaft being over the center of the mortar, the crank causes the stem, in order to pass through it, to incline somewhat, and so tilt the pestle to one side. The main vertical shaft is rotated by suitable gears and pulleys.

When this shaft is revolved the crank is revolved and carries with it the stem of the pestle. By holding this stem out at a certain distance and making it describe a circle outside of the vertical central line of the mortar, causes the pestle to tilt upon each of its dies successively, thus producing a crushing and grinding force, the whole weight of the pestle being thrown upon each die as it is tilted by the revolution of the crank; and as the faces of the dies are made in a plane tangential to the radial line of the movement of the pestle, a series of flat surfaces of the dies, parallel to the flat bottom of the mortar, intermittently strike the ore percussively. The stem, by passing loosely through the crank is not revolved upon its own axis, and consequently the pestle does not turn in the mortar.

ASSESSOR WALLACE'S bullion tax books show that the value of ores extracted from the various mines of Eureka district since 1873 amount to $30,046,002.32. Mr. Wallace has no data of the previous four years, as this county was then a portion of Lander, and all the records belonged to that county.

THE Mountain View mining company will soon put up a mill at Hot Creek mining district.

On Minerals.

[Notes of a Lecture delivered before the Mechanics' Institute by A. W. JACKSON, Jr., Instructor of Mineralogy, Petrography and Economic Geology, at the University of California.]

Most persons would resent any imputation cast upon their general knowledge of animals and plants, of the forms of the animal and vegetable kingdoms. In one way or another in the course of our education, the subjects of botany and zoology are brought sufficiently to our attention to give us very good general ideas of organic forms. If we do not get this knowledge at school, it is not at all difficult to obtain it from books, with the help of such plants and animals as can easily be gathered in our daily walks. Now, unfortunately, mineralogy is not taught in our schools, and it is impossible to learn very much about minerals from books without the aid of well-arranged mineral collections. Whence it comes about, that while you rarely meet a person unfamiliar with at least the elements of the organic natural sciences, you just as rarely meet one who knows anything about the inorganic natural science.

I have thought, therefore, that it might be interesting to you this evening, to present a short, necessarily brief, account of the whole mineral kingdom, to give you a bird's-eye view, so to speak, of the whole mineral world, to the end that you may obtain, perhaps, a generalized conception of the mineral composition of our valleys and our mountains, our soils and our ores.

When we consider that the two great industries upon which modern civilization depends for its very existence—agriculture and mining—both draw their raw materials directly from the mineral world, and when we consider, furthermore, that the highest measure of success in those industries is attainable only after a thorough comprehension on the one hand of the mineral composition of soils, and on the other of ore deposits, it would seem that the subject would be full of interest for all.

Let me at the very outset define clearly what a mineral is, and draw the distinction between a mineral and a rock. If you take a colorless quartz crystal and hold it between yourself and the light, you can see that it is perfectly clear, that you have but a single homogeneous substance before you. Now take an equally familiar substance, a piece of granite. You see at once that it is "speckled;" that it is a mixture of three separate, distinct, recognizable substances, black scales which you call mica, smoky gray granules which you call quartz, and dull white granules which you call feldspar. It is a mixture, heterogeneous. You have at once then the leading distinction between a mineral and a rock. A *mineral* is any homogeneous body that is a direct production of nature without the intervention of organic processes. A *rock* is a mixture of two or more minerals. The minerals make up the rocks, while the rocks make up the larger features of the earth's crust.

The minerals are the letters of the alphabet with which the book of nature is written, or at least that volume which relates of her solid structure, while the rocks are the words of the language in which nature expresses her meaning in that book.

Chemistry teaches us that the world is composed of elements. Now while some few minerals, such as diamond, sulphur, gold, silver, copper, consist of but a single element, by far the most minerals consist of combinations of two or more elements associated together in very great variety and proportion. A mineral species comprises all mineral substances possessing the same or equivalent chemical compositions, and a certain fixed group of physical properties, such as crystal form, optical properties, etc.

You will find enumerated in works on mineralogy from 600 to 900 distinct mineral species. Each of these minerals is characterized by a particular group of chemical and physical properties, which distinguish it from all other minerals. The mineral is described by describing all of its properties, and it is determined by determining each of its properties.

Now I shall not pretend to describe single minerals to you to-night, for I could not do so intelligibly unless you were familiar with all these mineral properties in the abstract; but I shall try to give you some account of

The Larger Groups of Minerals.

From the time when minerals first attracted the attention of the student of nature, there have been attempts to classify them, to segregate and arrange them into groups of related substances.

With all of the refinements of modern scientific methods, this has not yet been finally accomplished. There is to-day no systematic classification or grouping of minerals that is acknowledged by all to be satisfactory, nor even to be the best. Evidently, however, if we wish to obtain any *general* idea of the mineral kingdom, we must segregate the minerals into groups. The grouping which I have adopted, (Breithaupt's modified by Weisbach) and which I teach to my students, is curiously enough identical in its main features with the system suggested by Avicenna in the 12th century, A. D.

Without attempting a strictly scientific grouping, admitting even a purely technical idea as a controlling feature in the classification, it yet brings most of the closely-related minerals into the same group, and enables us to obtain the

general view of them which I wish to present, I will present at once the entire system, and will then proceed to characterize the different groups more in detail.

Classification of Minerals.

I. Hydrolites (Soluble Salts)

II. Lithites ("Stones").
- 1. Kuphoxides.
- 2. Pyrites (silicates).
  - a. Silicates (Zeolites).
  - b. Phyllites (Hydrated silicates) (Micas).
  - c. Amphibites.
  - d. Amorphites.
- 3. Amorphites.

III. Metallites (Ores).
- 1. Halometallites (metal salts).
- 2. Metal oxides.
- 3. Metallic metallites.
  - a. Pyrites.
  - b. Galenites (Galenite).
  - c. Cinnabarites (Blende).

IV. Combustibles.
- 1. Sulphur.
- 2. Anthracites (coals).
- 3. Asphaltites (Asphaltum).
- 4. Rhatinites (gums).
- 5. Paraffines (waxes).

Under the head of hydrolites, we group together all minerals that are readily soluble in water. The group comprises about 50 minerals, and the ordinary chemist would at once recognize the most of them as compounds with which he is familiar in his laboratory, while not a few are of common every day use, such as table salt, borax, soda, epsom salt, alum, blue and green vitriol and nitre. Chemically, these hydrolites consist of combinations of two or three of the common acids, like sulphuric, carbonic, muriatic and nitric, with soda, potash, ammonia, lime, magnesia and two or three of the heavy metals, such as iron and copper. Physically, they present nothing striking and often cannot be distinguished from the artificially prepared salts of the laboratory.

Now with respect to their geological occurrence. The original

Form of Occurrence

in nature and the permanence of the deposits of the hydrolites are determined strictly by that property by virtue of which they are classed together, viz.: their solubility in water. They are deposited mostly from solution in water, and in greatest quantity from inland seas, forming widely extended beds covering often hundreds of square miles.

Thus have been formed the extensive salt deposits of previous geological ages that are now found inter-bedded with clays in various parts of the world. Wherever these beds by subsequent disturbances are exposed upon the surface of the earth in countries with moist climate, they rapidly wear away, are dissolved and carried with the drainage water back into the sea. In dry countries, however, like Peru and Nevada, salt beds are actually found cropping out on the very surface. Of such character are the famous nitre-beds of Peru which have figured so largely in the present troubles between Peru and Chili. Similar nitre deposits have recently been discovered in Nevada, although their exact extent and nature have not yet become generally known. Another mode of occurrence of hydrolites is as a decomposition product on ore deposits. Many old miners have doubtless noticed the formation of crusts and stalactites of green and blue vitriol, in their drifts and tunnels, and strongly impregnating their mine waters. These result from the oxydation of the sulphurets of their ore to sulphate of iron and copper which are soluble in water, and crystallize out on the first opportunity.

The occurrence of the common iron sulphurets in very many rocks is the cause of the formation of delicate efflorescences of sulphates on the rock surfaces, to be washed away, however, by the first rains that come. Finally, one of these hydrolites (sal ammoniac) has been detected as a volcanic exhalation.

While the occurrence of large bodies of these hydrolites is thus restricted to countries with dry climate, or buried deep within the protecting solid rocks of the earth's crust in other countries, in small quantities they are being constantly formed everywhere. The solid rocks which compose our mountains, and the soils of our valleys, are constantly undergoing decomposition from rain waters containing carbonic and other acids in solution; the soluble portions are leached out and make their appearance in mineral springs or are carried into the surface drainage and ultimately reach the sea. Examine the analyses of well-waters and river-waters everywhere; they will all show more or less of these minerals in solution, and the aggregate amount that reaches the ocean annually is something enormous. You will observe then the cycle of phenomena constantly recurring. The land continually leached by descending atmospheric waters, insoluble parts left behind, the soluble parts taken to the sea, concentrated, deposited, and elevated again into dry land. The salt beds which we work are the leachings of the rocks of preceding geologic ages, and the leachings of to-day will form the salt beds of coming geologic ages.

Lithites.

The extensive class of stony minerals, containing somewhat over 200 species, comprises the minerals with which you are more familiar as ordinary stones.

They differ from the salts in being insoluble in water, and from the metallites in containing none of the heavy metals as essential constituents. They possess the distinctively stony luster which, from its very common occurrence, is called *common* luster, in contradistinction to that of most ores, which is called *metallic* luster. Finally, they are distinguished from the combustibles by their incombustibility.

We can subdivide this class into three well characterized orders: Kuphoxides, Silicates, Non silicates.

Kuphoxides.

This order comprises the compounds of silicon, aluminum and magnesium with oxygen. It is distinguished by the facts that it contains the commonest mineral, viz., quartz, and also some of the most precious, viz., rubies and sapphires varieties respectively of spinel and corundum.

The leading minerals and varieties of the order may be thus tabulated:

Spinel.

Spinel ruby (carmine).
Balas ruby (rose).
Rubicelle (orange).
Almandine (violet).

Corundum.

Sapphire (blue)
Oriental emerald (green).
Oriental ruby (carmine).
Oriental topaz (yellow).
Oriental amethyst (violet).
Emery.

Quartz.

Rock crystal (colorless).
Smoky quartz (smoky gray).
Amethystine quartz.
Common quartz.
Jaspers, etc.

Opal and Chalcedony.

The chemical composition of all of these minerals is exceedingly simple. The spinel rubies consist of magnesia and alumina, while the corundum gems all consist of alumina only.

Their colors are most exquisite, otherwise they never could take rank as gems; but for one specimen that is found with a clear, faultless color and luster, many hundreds are found with different colors and faulty luster. It is the very rarity of these colors, combined with their quality, that makes them so valued. All are distinguished by their remarkably high hardness, which again adds to the value of the worked stone. They are surpassed in this respect by but one substance, viz., the diamond.

Spinel and corundum are not infrequently found in limestone and granite rocks, in the very place where they were originally formed; but most of the gems are found as washed and water-worn pebbles in placer gravels. The veritable land and home of the gems is the East Indian Island of Ceylon.

Of quartz, opal, and chalcedony, all of which are but different forms of silica, I need hardly speak. They are so common and occur in so many hundreds of different forms and colors, and places and uses, that they are more or less familiar to all. Opal differs chemically from quartz in containing a little water, while chalcedony is a mixture of the two. As I have just said, they occur in every conceivable color, and are very hard; the peculiar hexagonal shape of quartz crystals is certainly familiar. The precious varieties of quartz, and also of opal, furnish gems of a lower order, while the use of chalcedony under the names of onyx, sardonyx, carnelian, and heliotrope, for ring-stones, seals, medallions, and the like, is very common. But by far the most important occurrence of quartz is as a rock-constituent, in which form, associated with feldspar, micas, and hornblends, and in the form of sandstone, it makes up a very considerable proportion of the entire solid crust of the earth.

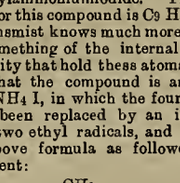
Pyrites.

We come next to the silicates or combinations of silica acting as an acid with the alkalies—potash, soda, lithia—and the alkaline earths—lime, magnesia and alumina. The heavy metals are excluded as essential constituents from these minerals, but iron in particular is very commonly present as an accessory constituent.

Many of these minerals are characterized by very complicated chemical composition; indeed, silicon seems to play the same part in the inorganic world that carbon plays in the organic world. It is extremely interesting, however, to observe the unequal progress that chemistry has made in the study of these two different classes of compounds; the carbon and the silicon, the organic, or those which enter into the composition of animal and vegetable structures, and the inorganic, or those which enter into the composition of many minerals.

For reasons familiar to the chemist, the carbon compounds have been reduced to an order and system that form one of the greatest triumphs of modern science. In the matter of classifying the silicates, however, upon strictly scientific principles, we are still groping, to a great extent, in the dark. And again, the same differences exists with respect to the state of our knowledge of single compounds in the two different classes.

Take, for example, by no means an extreme case, the organic compound, monomythyldiethylisobutylammoniumiodide. The empirical formula for this compound is $C_9 H_{22} NI$; but the organic chemist knows much more than this; he knows something of the internal bonds of chemical affinity that hold these atoms together. He knows that the compound is an iodide of ammonium, $NH_4 I$, in which the four hydrogen atoms have been replaced by an isobutyl, a methyl, and two ethyl radicals, and he can rewrite the above formula as follows, showing this replacement:



With the silicon compounds, the case is far different; our chemical formulæ remain absolutely empirical; we can simply determine by analyses how many atoms of each element are present, and write them down in a formula without the least conception of the mutual relations of these atoms to one another.

The chemical symbol for schorl or black tourmaline is:

$$H_2 Fe_2 Al_4 B_2 Si_4 O_{20};$$

but exactly how these atoms are related to one another no one knows, and the same is true of most other silicates.

About 120 species are comprised within this order, and they are conveniently subdivided into four families:

Sclerites,
Zeolites,
Phyllites,
Amorphites.

The sclerites, by far the largest family (84 species), comprise all the hard, anhydrous silicates, and we shall find in this family all of the minerals which, with quartz, constitute the great mass of the known crust of the earth as it was originally formed. I have already called your attention to the leaching process to which the land is constantly subjected by atmospheric waters, dissolving out the soluble salts which find their way to the ocean. Now, we have among the sclerites the very minerals which are originally subject to this leaching, from the decomposition of which come these soluble salts.

(To be Continued.)

An Ice Locked Ship.

The loss of the *Jeannette* by ice crushing and the toilings of her crew upon the waters and snowfields of the cruel Siberian coast give heightened interest to the accounts of Arctic dangers. The latest news is that a portion of the survivors of the *Jeannette* expedition who succeeded in reaching the Siberian settlements, had cast their faces again northward in search for their companions who were thought to be leading a forlorn hope in the trackless ice and snow wastes adjacent to the mouth of the Lena river. It is to be hoped that the search may prove successful and the sufferers rescued.

The engraving on this page, which shows the *Corwin* in the grasp of the ice field, will give the reader some idea of the perils of Arctic navigation. The *Corwin*, it will be remembered, was first sent out by the United States Government, in 1880, to search for the *Jeannette*, and was ordered out on a second voyage, for a similar purpose, in 1881. Upon his return from the cruise, Capt. Hooper reported to the Secretary of the Navy the incidents of his voyage, accompanied by some drawings to show the perils into which he came and the geographical observations made. From this report we take the accompanying engraving and descriptive notes:

THE ARCTIC EXPLORING SHIP "CORWIN" IN A NIP OFF CAPE ROMANZOFF.

On the morning of the 15th we found ourselves utterly helpless, drifting with the pack to the southward and eastward about two miles per hour. At first this caused no uneasiness, but about 8 A. M. it was noticed that we were among grounded ice. We had only five fathoms of water, and many large pieces were hard and fast on the bottom. Coming in contact with some of these grounded pieces the vessel got some pretty sharp nips, which tried her strength. At one time she was lifted bodily up several feet, and held suspended for some minutes; coming in contact with one, "stern on," the rudder was forced over, the screw steering-gear carried away, and the wheel-chains parted. Happily the rudder-stock, which is of the best Oregon oak, stood the strain, although for a time it seemed as if nothing could save it.

With this experience of the danger to which the rudder was exposed, I saw the necessity of having it rigged so that it could be unshipped at short notice, and set to work accordingly. All hands piled sacks of coal on the forecastle until the vessel was tipped sufficiently to raise her stern and allow us to get at and split out the wood-lock. A piece of oak plank was secured across the rudder-head by means of four long iron bolts, in such a way as to keep the rudder from unshipping by the action of the seas, and to be readily removed should it become necessary. We next cut a piece on the apron the size of the rudder-casing, so that the rudder-head could go forward sufficiently to allow it to unship without removing the apron entirely, then rigged a pair of sheers and rove off a purchase, so that the rudder could be taken in, out of the way of danger, in a few minutes. On the 16th, we drifted helplessly in the pack all day. On the morning of the 17th, clear water could be seen, from the mast-head, to the northward and westward. At the same time a slight roll of the sea was perceived, indicating that it was quite a large space. After working toward it all day, we succeeded in reaching clear water in the evening, having made about four miles in 10 hours.

The *Corwin* thus escaped to fight the ice again another day. The *Jeannette* met a harder fate. For 18 months she was ice locked and her crew prisoners. Then she yielded to the crushing of the ice and her crew were forced to the perils and adventures of which a full account is to be given on the return of the survivors.

A delegation of Zuni Indians from New Mexico has gone to Washington.

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It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

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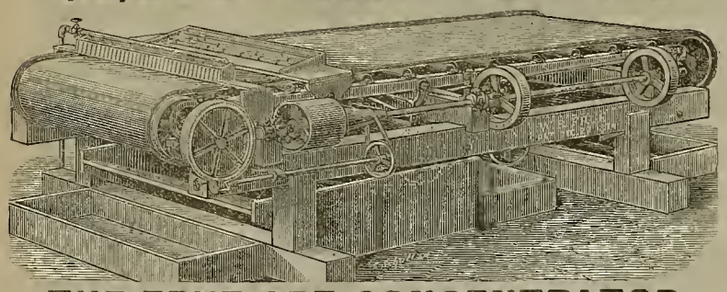

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Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.

We challenge any other Concentrator in use for a fair and impartial competitive trial, side by side, for stakes of $1,000 each, and we mean business.

☞A machine with all improvements can be seen in working order and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont street.

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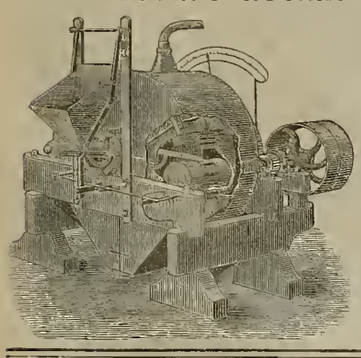

WORKS ORE WET OR DRY,

And Feeds Itself Automatically.

Patented October 11, 1881.

One of these machines can be seen at the Ore Sampling and Pulverizing works of Hofmann Bros., No 415 Mission St., where it is working every day. Weight 5,000 lbs., heaviest piece 480 lbs.

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By W. I. TUSTIN, Inventor and Patentee.

ENGINE LATHES IN SECTIONS.

Limit of weight for 25-inch Lathes, 300 pounds, For 17-inch Lathes, 150 pounds.

Standard and Special Machine Tools.

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Scientific Press **Patent Agency.**

[ESTABLISHED 1860.]

Inventors on the Pacific Coast will find it greatly to their advantage to consult this old experienced, first-class Agency. We have able and trustworthy associates and Agents in Washington and the capital cities of the principal nations of the world. In connection with our editorial, scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other Agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of Patents already granted, for the purpose of determining the patentability of inventions brought before us, enables us often to give advice which will save inventors the expense of applying for Patents upon inventions which are not new. Circulars of advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 252 Market St., S. F.

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.
☞Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England.
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42 years' practical experience; 14 on Pacific Coast.
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Manufacturers of
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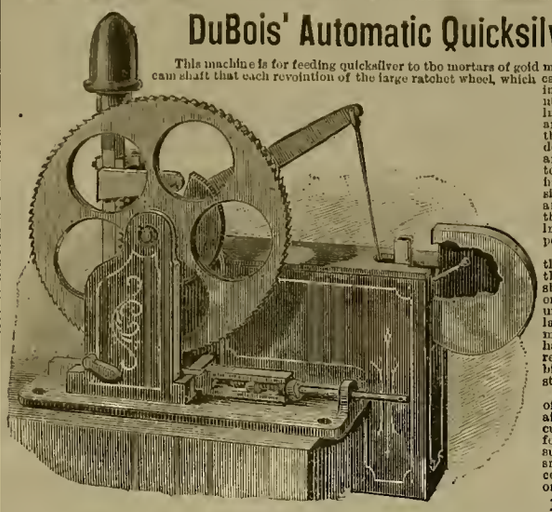
THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand
SHEET IRON PIPE.
Lap-Welded Pipe, all Sizes, from Three to Six Inches. Artesian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.
Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.
Office and Manufactory, 130 Beale Street, San Francisco.
SHEET IRON PIPE.

DuBois' Automatic Quicksilver Feeder.



This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.
The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.
A chief point of excellence of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; *i. e.*, from every one to four minutes.
Price, complete, $100.

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HOWLAND'S PULVERIZER Takes the Place of the Cumbersome Stamp Mill and can be put up in one day ready for work.
IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds It costs $1,500 ready for the belt Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.
Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores Chloridizing Furnaces, Retorts, Rock Drills Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies Iron Work complete for Wood Frames, also
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☞Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
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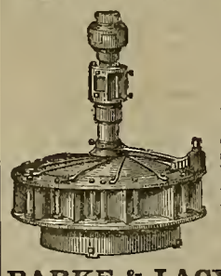

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Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
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FROM 1-4 TO 10,000 lbs. WEIGHT.
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Gold, Silver and Lead Ores and Sulphurets.
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San Francisco Cordage Factory.
Established 1856.
Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
Extra sizes and lengths made to order on short notice
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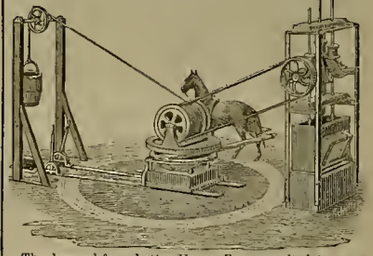
New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
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PATENT DETACHABLE TOOTH SAWS,
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Palmer's Safety Clutch
FOR
ELEVATORS
Will be Applied to Elevators on Short Notice.
☞It is now used in the U. S. Army Building and Grand Hotel, New Montgomery Street.
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 22 Market St., S. F.

FOR THE WEEK ENDING FEBRUARY 21, 1882.

253,907.—ANIMAL TRAP—Alex. Andre, Bakersfield, Cal.
253,914.—TESTER FOR EXPLOSIVES—G. S. Dean, S. F.
254,011.—EMERY WHEEL—M. Hofstad, San Leandro, Cal.
253,927.—TENSION BRACE—Aaron Lawson, Gilroy, Cal.
253 930.—HORSESHOE—William Leed, Oroville, Cal.
253 936.—GRAIN SAVING ATTACHMENT FOR SEPARATORS—Neil McLean, Watsonville, Cal.
254,071.—BOOT—R. Thompson, S. F.
253,903.—WATCHMAN'S TIME DETECTER—H. J. Wenzel, S. F.
253,964.—STATION INDICATOR—H. J. Wenzel, S. F.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

TENSION BRACES.—A. Lawson, Gilroy, Santa Clara Co. No. 253,927. Dated Feb. 21, 1882. This tension brace consists in a wire or other flexible rod eo twisted at its middle as to form a double loop somewhat in the form of the figure 8. The ends of the wire project in opposite directions and at right angles with the loop, and are provided on their tips with screw threads. These threads are formed on one end to make a right-hand screw and on the other a left-hand screw, so that when screwed in place, they draw in opposite directions and pull tight on the central loop, which locks itself. The use of this brace is confined to articles the joints of which are liable to separate and need holding together. It may be used on hedsteads, chairs, or tables, etc. In any available corner one of these braces may be screwed and its projecting loop act as a hat-rack or hook or peg on which to haog articles.

HORSE-SHOE.—Wm. Leech, Oroville, Butte Co. No. 253,930. Dated, February 21, 1882. Tbie invention relates to the class of horse-shoes the object of which is to spread or expand contracted hoofs. It consists in two sides pivoted at the front center to a toe-plate, said toe-plate forming a hearing or support for a peculiar spring which lies thereon, and whose ends embrace the rear ends of the sides, whereby its tension is exerted at the ends. The beneficial object is further accomplished by the position of the nails in the shoe, whereby the outward pressure is brought to hear to the best advantage.

GRAIN SAVING ATTACHMENT FOR SEPARATORS.—Neil McLean, Watsonville, Santa Cruz Co., Cal. No. 253,936. Dated, February 21, 1882. This grain-eaving device for thrashing machines consists in the details of construction of a supplemental attachment to a straw carrier, whereby the straw is stirred and agitated as it leaves the carrier, so the grain mechanically entangled in the etraw may eecape and he recovered.

ANIMAL TRAP.—Alexander Andre, Bakersfield. Dated, February 21, 1882. No. 253,907. Tnis is a trap for gophers and other hurrowing rodents, and it is made in such a manner that the gate is less liable to become choked, so as not to close freely. A peculiarity is that a little slide makes the tube dark, so that no light ehall make the mole or gopher suspicious. The trap is eaid to have heen a very successful one.

A FEW days ago, in what is known as the "Old Walker Porphyry Claim," near Shingle Springs, El Dorado county, parties etruck a "pocket," from which they took a considerable amonnt of ore that paid them $250 to the pan, and were working quite a large vein that was averaging $10 to the pan, when the water rushed in and drove them out.

THE Bristol *Times* is in receipt of a letter from Cherry Creek in which the writer advises the Bristol and Pioche people not to go there in search of work, as nearly everything ie shut down. He statee that though the Star mine is being worked that there are more men there now than can find employment.

QUITE a number of Comstock miners are making arrangemente to go out along the line of the Carson & Colorado railroad this spring, as soon as the weather becomee eettled, for the purpose of prospecting and working in mines already located.

DURING the quarter ending Decemher 31st the Ophir, Crown Point, Belcher, Consolidated Imperial and two other mines produced 20,611 tons of ore, valued at $310,704. This is the smallest quarterly yield of the Comstock mines in many years.

AN immense "blow-out" of copper ore is found on one of the highest peaks of the Wasatch range in Utah, assays from which show 25% of copper, with from $7 to $8 of gold and silver to the ton.

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

Graphite—Wood River, Idaho. Mr. Hailey.
Marble, Water-worn—Bed of the Tuolumne river. Lewis Costa.
Gold Quartz—Gold Blossom mine, Crater hill, near Ophir, Placer county, Cal. R. L. Dunn.
Compressed Asphaltum Paving Blocks—L. L. Robinson.
Amethyst—Lake Superior.
Garnets Detached from Garnetiferous Mica Schist—Found at the mouth of Stickeen river, Alaska. (See Nos. 2328 and 3812.) Laura E. Crane.
Copper-Stained Quartz—In which there is a cavity containing two perfect crystals of cerargyrite or horn silver, surrounded with bright metallic silver. A very rare and beautiful speciuen. Sierra Madre, Arispe, Sonora, Mexico. C. J. Pilsbury.
Fibrous Bituminous Artificial Stone Block for Street Pavements—Manufactured by the Cosmopolitan Paving and Asphaltum Company, and donated by Robert Skinner.
Crystallized Sulphur—Twenty miles north of the Humboldt station, C. P. R. R., Humboldt county, Nev. H. W. Faust.
Slab of Mica Schist with Garnets—Mouth of Stickeen river, Alaska. Donated by W. J. Buswell, Wrangle, Alaska, and brought down by Lieut. Commander Henry E. Nichols, of the steamer *Hassler*.
Murchisonia bicincta, Hall—Lower silurian fossil, Trenton limestone, Watertown, New York. D. S. Marvin.
Crinoidal columne—Upper silurian fossil, Ohio. D. S. Marvin.
Orthis occidentalis—Lower silurian fossil, Trenton limestone, Watertown, New York D. S. Marvin.
Modiolopsis modiolaris, Con.—Lower silurian fossil, Loraine shale, Watertown, New York. D. S. Marvin.
Petraia corniculatum—Upper silurian fossil, Niagara Gr., Ohio. D. S. Marvin.
Rhynchonella increbescens, R. Capex—Lower silurian fossil, Trenton limestone, New York. D. S Marvin.
Tridesia (Camarella) Sp. (?)—Lower silurian fossil, Trenton limestone, New York D. S. Marvin.
Murchisonia subconica (?)—Lower silurian fossil, Trenton limestone, New York D. S. Marvin.
Orthoceras Sp (?)—Lower silurian fossil, Loraine shale, New York. D. S. Marvin.
Bucania bidorata, Hall (Bellerophon bidorsatus)—Lower silurian fossil, Trenton limestone, New York. D. S. Marvin.
Chetetes lycoperdon (Monticalinora lycoperdon)—Hemispherical and ramose forms, lower silurian fossil, Trenton limestone, Watertown, New York. D. S. Marvin.
Strophomena Sp. (?)—Lower silurian fossil, Trenton limestone, New York. D. S. Marvin.
Trematis Sp. (?)—Lower silurian fossil, Trenton limestone, Watertown, New York. D. S. Marvin.
Orthoceras arcuilratum, Hall—Lower silurian fossil, Trenton limestone, Watertown, New York. D. S Marvin.
Orthoceras tuseptum, Hall—Lower silurian fossil, Black river limestone, Watertown, New York D. S. Marvin.
Palæsrca Sp (?)—Lower silurian fossil, Trenton limestone, New York. D S. Marvin.
Strophomena rhomboidalis—Lower silurian fossil, Trenton limestone, Champlain, New York. D. S. Marvin.
Placer Gold—Hoosie Bar, Middle Fork of American river, eight miles from Auburn, Placer county, Cal. T. L. Flanagan.
Crytolites compressus, Con.—Lower silurian fossil, Trenton limestone, Watertown, New York. D. S Marvin.
Orthis vanalica, Hall—Lower silurian fossil, Hudson river group, New York D. S. Marvin.
Leptæna sericea, Sow—Lower silurian fossil, Trenton limestone, New York D. S. Marvin.
Heliophyllum Halli, Edwards & Haime—Devonian fossil, Hamilton period, Ohio. D. S. Marvin.
Illenus crassicauda, Wahlenberg—Lower silurian fossil, Trenton limestone, New York D. S. Marvin.
Phytopsis cellulosum, Hall—Lower silurian fossil, Bird's Eye limestone, Watertown, New York. D. S. Marvin.
Bathotrephis succulens, Hall—Lower silurian fossil, Trenton limestone, Watertown, New York. D. S. Marvin.
Patent Compressed Paving Tile or Slab—Asphaltum base with cement top. Robert Skinner.
Iron Ore (Magnetite)—Solid Iron Mine, Indian district, Mono county, Cal. D. P. Tarpy. Analysis by Faulknan & Reese: Peroxide of iron, 93.0; silica, 7.00; total, 100.00; graphite and sulphide of copper, traces.
Favosites niagarensis, Hall—Upper silurian fossil, Niagara period, New York. D. S. Marvin.
Amboncychia amygdalina—Lower silurian fossil, Trenton limestone, New York. D. S. Marvin.
Endoceras proteiforme, Hall—Lower silurian fossil, Utica shale, New York, D. S. Marvin.
Orthoceras junium, Hall—Lower silurian fossil, Trenton limestone, New York. D. S Marvin.
Soapstone or Steatite—Cut in the form of bricks and of the same size, to be used as substitute for fire-brick, Lewis, Mariposa county, Cal. R. M. Collins.
Natural Bamboo—Cut of a Very Large Bamboo or Concretion Strongly Resembling the Same—Near Tholame, San Luis Obispo county, Cal. J. Z. Davis.
Sandstone Concretion Resembling an Obscure Fossil Fish—Near Tholame, San Luis Obispo county, Cal. David Russell.
Glass Model of the Guadalupe Quicksilver Mine—Santa Clara county, Cal., made by Chas. T. Healy, who is the originator of the idea and presented by R. B. Thayer. This is a new and very effective mode or showing the underground workings of a mine.
Miniature Glass Model of the New Almaden Quicksilver Mine—Santa Clara county, Cal. Made and presented by Chas. T. Healy.
How and Rifle and Undercurrent—Wm. H. Howland.
Photograph of "Gorilla Niger"—Male, from a specimen in the museum at Lubeck, Germany. Jas. Behrens.
Photograph of Gorilla—Male and female, from specimens in the museum at Lubeck, Germany. Jas. Behrens.
Photograph of "Gorilla Gina"—Female and young, from specimens in the museum at Lubeck, Germany. Jas. Behrens.
Photograph of the Mammoth, "Elephas Primigenius"—Restored from measurements from the bones in the Royal Museum at Stuttgart, and data afforded by the St. Petersburg one. Prof. Henry A. Ward.
Vertebræ of Whale—Monterey whaling station. J. Z. Davis.
Rib of a Whale—Monterey whaling station. J. Z. Davis.
Jawbone of a Whale—Monterey whaling station. J. Z. Davis.

IRA S. PARKE, a well-known mining man of Virginia, Nev., dropped dead on Montgomery street last week. He had come to this city to attend the funeral of his brother, Francie A. Parke, who was killed the other day at Emery station, Alameda, hy heing run over hy the cars. He wae 54 years of age and one of the pioneers. He was one of Nevada county's leading citizens in early days, and was one of the first eettlere in Virginia City. He huilt the old Gould & Curry mill there. A brother of the deceased is a memher of the firm of Parke & Lacy, dealers in mining machinery, Noe. 21 and 23 Fremont street.

THE EUREKA QUARTZ MINE CASE.—This mine liee near Hornitos, Mariposa county; some time since the owners desired to file an application for a patent, which was refused by the Register and Receiver of the land office at Stockton, on the ground that the application embraced a portion of caeh entry made by Mrs. Delilah Scroggins. The caee was appealed, and the Hon. Commission at Washington has suetained the decision below, and ordered a hearing, to determine the character of the land.

Naturalists' Directory.

Collectors in the various departments of natural history find that they can aid each other greatly hy exchange of material. One who is interested in the work, asks the PRESS to copy from Casino's Directory a list of the names of California collectors, not claiming that it is complete, hut stating that those mentioned are willing to correspond and exchange material with others in the same line of study. We publish the list to facilitate correspondence and exchange, and thus eerve our readers who have leaning toward studies in natural history:

Ca ifornia Collectors Who Will Exchange.

Geo. W. Warren, Ferndale, Humboldt Co., botany, ferns, etc.
Mary E. P. Ames, Auburn, botany.
Rev. F. H. Wales, Dutch Flat, Placer Co., mineralogy.
Charles L. Anderson, M. D., Santa Cruz, botany, algæ.
Melville Atwood, Santcliff, geology. Special branch, inclosing, or wall rocks of metalliterous veins. Exchanges in speciality.
Mrs. K. F. Bingham, Santa Barbara, botany.
Frank E. Blaisdell, Poway, San Diego Co., entomology (local). Exchanges in ecology and coleoptera.
Mrs. S. G. Blaisdell, Poway, San Diego Co., ferns.
S. Bluthner, Lockeford, San Joaquin Co., coleoptera.
S. D. Bradstow, care Wells, Fargo & Co., S. F., paleontology, mineralogy.
Elisha Brooks, 1725 Sutter St., S. F., ferns.
Mrs. A. E. Bush, Curator State Normal School Museum, San Jose, conchology, mineralogy, algæ.
Miss Jennie R. Bush, San Jose, entomology.
George D. Butler, Fort Jones, Siskiyou Co., botany.
J. W. Calkins, Santa Barbara, conchology, algæ.
A. W. Crawford, Oakland, botany, paleontology, geology, mineralogy.
Andrew T. McCreery, 519 Jones St., S. F., coleoptera.
Roscoe P. Chandler, Riverside, San Bernardino Co., ecology.
Miss Kate O. Sessions, 1423 7th Ave., East Oakland, ferns, mineralogy, entomology, mollusks.
Daniel Cleveland, San Diego, botany, ferns, marine algæ.
Mrs. Elwood Cooper Santa Barbara, botany.
J. A. Edmau, Meadow Valley, Plumas Co., geology, mineralogy, meteorites.
Gustav Eisen, Fresno, annelida, oligochæta. Exchanges types of oligochæta.
William G. Flint, 210 Sansome St., S. F., mineralogy, shells, ornithology, ecology. Exchanges in ecology.
H. C. Ford, Santa Barbara, ferns, algæ, paleontology, archeology, conchology
F. G. Hall, Greenville, Plumas Co., chemistry, mineralogy, geology.
D. W. Hambly, Spanish Ranch, Plumas Co., geology, mineralogy, meteorites, general biology.
Laura J. F. Hecox, Santa Cruz, conchology. California shells in exchange for land and fresh-water shells, fossils, etc.
E. K. Hill, Brownsville, Yuba Co., botany, ornithology, entomology.
A. W. Jackson, University of California, Berkeley, mineralogy, microscopy, lithology.
G. Walter Johnston, Sacramento, botany, gimnaceous plants, fungi.
Prof. Josiah Keep, Alameda, conchology, Fine Pacific in exchange for Atlantic and foreign shells.
Prof. George R. Kleeberger, San Diego, botany, zoology, embryology, arachnida.
Edgar L. Ricksecker, P. O. box 2211, S. F., coleoptera.
S. B. P. Knox, A. M., M. D., Santa Barbara, algæ, microscopy, entomology.
Miss Helen Lennebacker, Santa Cruz, algæ.
George W. Michael, Jr., Moro Bay, San Luis Obispo, geology, mineralogy.
S. M. Mouser, M. D., 235 Kearny St., S. F., microscopy, general botany, vertebrate embryology.
William Norris, 316 California St., S. F., microscopy.
Mary E. B. Norton, San Jose, botany.
Carrie A. Whelan, 311 Fourth St., Oakland, coleoptera.
John H. Orcutt, San Diego, conchology, ecology.
George H. Peck, El Monte, Los Angeles Co., lepidoptera.
Miss Emily O. Pelton, Brownsville, phenogamic botany, ferns.
W. S. Phelps, Ferndale, Humboldt Co., botany.
J. B. Pownall, Berkeley, coleoptera.
George H. Ready, Santa Cruz ecology.
J. Edward Reed, Wright's Station, Santa Clara Co., mineralogy, mound builders and Indian relics.
O. N. Sanford, San Diego, general natural history (local). Exchanges in coleoptera and conchology (general)
Frank M. Stone, 216 Sansome St., S. F., shells, ornithology, ecology
F. L. Button, 859 Broadway, Oakland, conchology, mollusks.
James A. Hall, Watsonville, Santa Cruz Co., general exchange.
Ferdinand McCann, Santa Cruz, ecology. Exchanges eggs in sets.
Miss Fiuma Swain, 1354 8th Ave., East Oakland, minerals, mollusks.
Miss Cornelia Walker, San Jose, marine zoology.
Miss Mary E Wilson, ferns, algæ
Chas. T. Winslow, S. F, conchology, ornithology, ecology. Exchanges shells, birds, skins, nests and eggs.
Mrs. Lizzie Wright, Monterey, ferns.
W. G Wright, San Bernardino, botany, palms, cacti, ferns, seeds, etc. Exchanges for rare ferns.
Dr. Lorenzo G. Yates, Centerville, Alameda Co., conchology, geology, mineralogy. Many specimens for exchange. Send list.
Lucien A. Blochman, San Diego, conchology, algæ. Offers all specimens found in San Diego.
Philip Sidney Carlton, corner 19th and Brush Sts., Oakland, coleoptera.
Laura G. Feely, Patchen, Santa Clara Co., shells and curiosities.
Moses L. Frick, San Diego, conchology.
Prof. Milo H. Gates, Green Valley, El Dorado Co., botany.
John H. Russell, San Jose, Santa Clara Co., exchanges Pacific coast shells for those from any part of the world.
James E. Waltham, San Diego, conchology, algæ. Offers all specimens found in San Diego or northern part of Lower California.
F. V. Hopkins, M. D., East Lake, Lake Co., mineralogy, geology
Lewis Locke, 926 Jackson St., S. F., ornithology.

A RAISE IN ORE PRICES.—Another break occurred last week in the price of ore, hy a material advance in rates hy the Boston and Colorado works, which has been followed hy the other huyers. The old price was a deduction from the New York quotations for fine silver, of 10% and $20 per ton. The new price first deducte 9% for ore carrying less than 100 ozs. per ton; 8% for ore hetween 100 and 200 ozs.; 7% for ore between 200 and 300 ozs.; 6% for ore hetween 300 and 400 ozs., and 5% for all ore carrying over 400 ozs. Under this list 400-ounce ore ie worth $22.60 more per ton than under the old price; 100-ounce is worth $2.26 more; 200 ounce, $6.78 more; 300-ounce, $13.56 more, and 1,000-ounce, $56.55 more. The Golden and Valley works pay 30 cents per nnit for each nnit of lead when the lot aesays over 10% lead and less than 100 ozs. of silver per ton. Tnis list will make the hoys feel happy and should stimulate production.—*Georgetown (Col.) Courier.*

FRUIT VS. VEGETABLES.—One of the latest theories advanced is, that apples are more nutritious than potatoes, and in Cornwall, England, workmen say they can work hetter on the fruit than on the vegetable.

THE Arizona *Star* says: Almost $12,000,000 of treasure were sent out from this so-called harren conntry. This year we promise the world $25,000,000 in gold, eilver and copper.

The Governor Declares Saturday a Legal Holiday.

SACRAMENTO, March 1.—The following proclamation has been issned by Governor Perkins:

WHEREAS, The question of Chinese immigration is of such vital importance to the welfare and best interests of this State, and as a hill is now pending before Congress to prevent the further influx of this class of people, and believing it to be the almost unanimous wish of the citizens of California that said hill should become a law, I have been urgently requested to declare Saturday, the 4th day of March, a legal holiday, that it may be made the occasion for one universal demonstration, conveying to Congress and to our Eastern hrethren the deep interest which inspires us to check this evil and stop this curse of slavery. This request is made oy a large and influential class of merchants, and by both the great political parties, and influenced by the same motives, partaking of a kindred spirit with them, and seeing the time has come for the exercise of the great, harmonious and simnitaneous effort to rid the State of this evil, I, George C. Perkins Governor of the State, do by the authority vested in me, proclaim Saturday, March 4, 1882, a legal holiday, and ask that in the several cities and localities of the State such demonstration he had as will show the feeling of our people in this question.

GEORGE C. PERKINS.
Governor State of California.

News in Brief.

THE electric light has found its way into India. At Calcutta the public gardens are lighted hy it, and the Elgin mills at Cawnpore also are.

THE House Committee on Invalid Pensions on Friday received a petition asking that the widow of ex-President Polk he put on the pension rolls.

LIEUT. DANENHOWER hae heen forhidden to start for St. Petersburg nntil the weather gets warmer. The remainder of the survivors of the *Jeannette* will start without him.

TWENTY-FIVE female doctors, who took part in the military operations of Russia in 1877, have heen decorated by the Emperor with the order of St. Stanielaus of the third class.

SENATOR MILLER introdnced a bill on Friday appropriating $175,000 for construction of steam vessels for the revenue marine, adapted for service in the waters of the North Pacific.

THE English iron masters of Middlesborongh have adopted the resolution of the Scotch iron masters at Glasgow, to prolong the six months' agreement restricting the manufacture of iron.

THE Stanislaus *Wheat Grower* says that most of the telegraph poles hetween Oakdale and Stockton have heen honeycombed hy woodpeckers.

A DISPATCH from Constantinople says: The mohilization of 150,000 troops is projected, in view of the probahle complications in Bulgaris, which make neceseary the occupation of the Balkans.

A COLONY of 220 Missourians contemplate settling near Benton, Montana, and it is reported that two colonies, one of 500 Scotch families, and the other of 400 German families, will locate near Glendive.

A PARTY of 150 English tourists, en route to the National Park, Montana, will reach the end of the Northern Pacific track early in the summer. They have contracted to pay $30,000 for transportation hetween that point and the park.

A MEMBER of the Horticultural Commission states that the orchards of Alameda county are more extensively infested with destructive insecte than the orchards in any other county in the State. This statement ronses considerable opposition.

B. B. HOCHKISS, the Americsn who invented the revolving cannon, has received the decoration of the Legion of Honor from the Frenoh government for his services to that country, and the Danish government has given him the Cross of Denmark.

THE work on the Atlantic & Pacific railroad eastward from Mohave is going forward as rapidly as circumstances will admit. It is reported at railroad headquarters, that the rails are all laid for a distance of 4,200 ft. The constrnction gang is eight miles out, grading and preparing the roadhed, and rnnners and snrveyors are ahead of the graders.

WITH one of the trains which went East this week was a car containing 25 sea lions, consigned hy A. C. Rohison to Charles Richie & Brother of New York for transportation to Europe. The animals were captured off the Santa Cruz Islands, and are of all eizes. They will he placed in crates, and from time to time will he delnged with water from a hose to preserve them in good condition.

THE tunnel to tap Eagle lake is now in 200 ft., and the preeent force is pnshing it at the rate of about 35 ft. per week. The entire distance to he pierced is ahout a mile and a half, and the work will prohahly he completed hy noxt fall, when the now harren wastee of sagehrush land of Honey Lake valley will be covered with water and made to produce in ahnndance.

THE Mntnal Union Telegraph Co., whoee system covers all the principal cities of the Union, except New Orleane and San Francisoo, is ahout to make a connection with thie ooast. Upon this point, saye James Gamble, General Superintendent of the company, well known here as formerly General Superintendent of the Pacific division of the Weetern Union Co.: "My nurpose in ooming here is to select a route for an extention of wires acroes the continent, and to see how each a proposition will he received hy the telegraphing puhlio, and what interest they will take in the matter. My plan is to huild a grand trunk line of three No. 6 wires hetween San Francisco and New York. This line will connect with all intermediate points.

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A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central systemin San Francisco.

THE State Mining Bureau, No. 212 Sutter Street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

ANNUAL STATISTICIAN of 1882.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 316 California st. Price, $4.

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San Francisco Metal Market.

[WHOLESALE.
THURSDAY, March 2, 1881.

IRON—	
American, Pig, soft, ton	— @35 00
Scotch, Pig, ton	25 50 @27 50
American White Pig, ton	— @—
Oregon Pig, ton	— @33 00
Clipper Gap, No. 1	— @37 00
Clipper Gap, White	— @34 00
Clipper Gap Car Wheel	— @35 00
Refined Bar	4 @
Horse Shoes, keg	— @ 5 50
Nail Rod	— @ 7½
Norway, according to thickness	6½@ 70
STEEL—	
English Cast, lb	13 @ 15
Black Diamond, ordinary sizes	13 @ 16
Drill	15 @ 16
Flat Bar	16 @ 18
COPPER—	
Ingot	— @ 22
Sheet	— @ 20
Sheating, Tinned 14x18	— @ 31
Nails	— @ 17
Bolts	— @ 33
Old	— @ —
Bar	— @ 22
Cement, 100 fine	— @ 15½
LEAD—	
Pig	— @ 5
Bar	— @ 6
Pipe	— @ 8
Sheet	— @ 9
Shot, discount 10% on 500 Bags	
Drop, per bag	— @ 2 10
Buck, "	— @ 2 30
Chilled "	— @ 2 50
TIN PLATES—	
10x14 I C Charcoal	7 00 @ 8 00
10x14 I C Coke	6 25 @ 6 50
Banca Tin	— @22 50
Australian	— @23 50
I. C. Charcoal Roofing 14x20	— @ 6 90
ZINC—	
By the Cask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @ 10
NAILS—	
Assorted Sizes	4 00 @ 4 15
QUICKSILVER—	
By the flask	@36½ 36½
Flasks, new	— @ 1 25
Flasks, old	— @ 1 05

Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

San Francisco, Cal., February 10, 1882.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No 60, of Fifty Cents (50c) per share, was declared, payable on Wednesday, February 15th, 1882. Transfer books closed on Saturday, February 11th, 1882, at 12 o'clock M.

WM. WILLIS, Secretary.

Office—Room 29 Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

ASSESSMENT NOTICE.

Consolidated Pacific Mining Company,

ASSESSMENT, NO. 4.

Amount	Forty Cents per share
Levied	January 28, 1882
Delinquent	March 3, 18-2
Day of Sale	March 27, 1882

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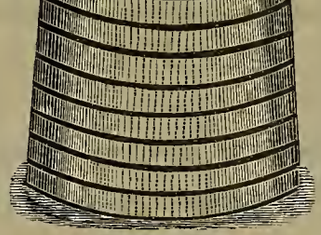

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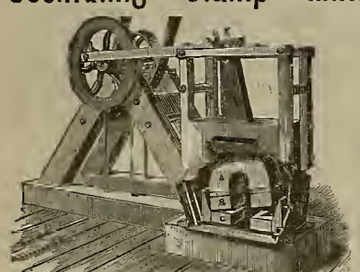
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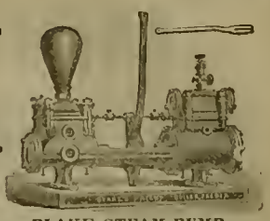

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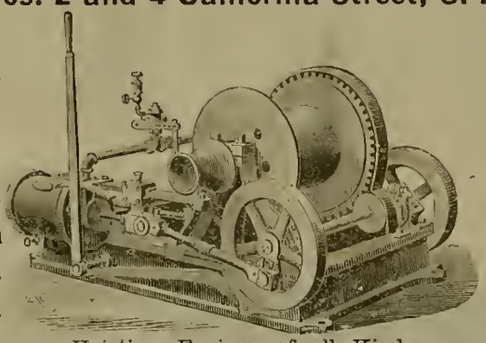

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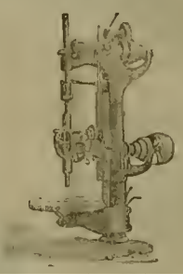

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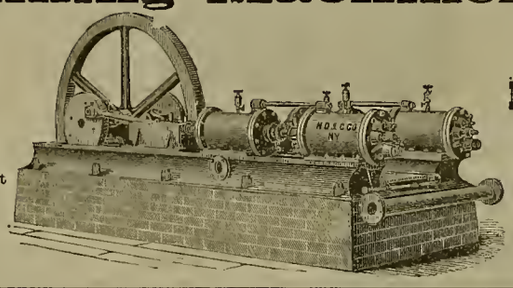

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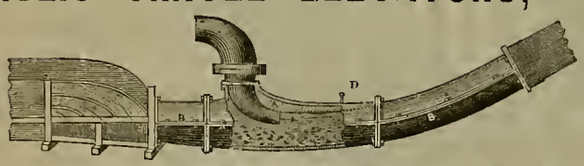

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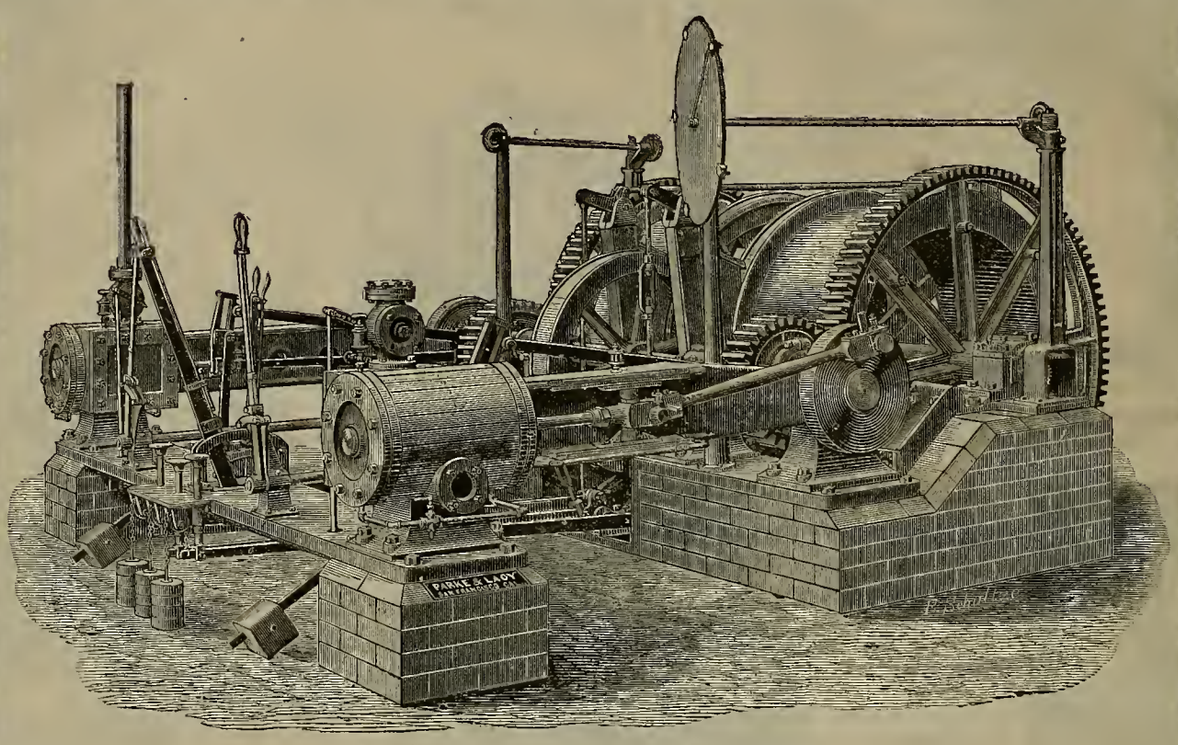

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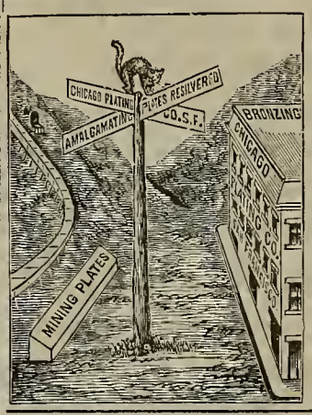

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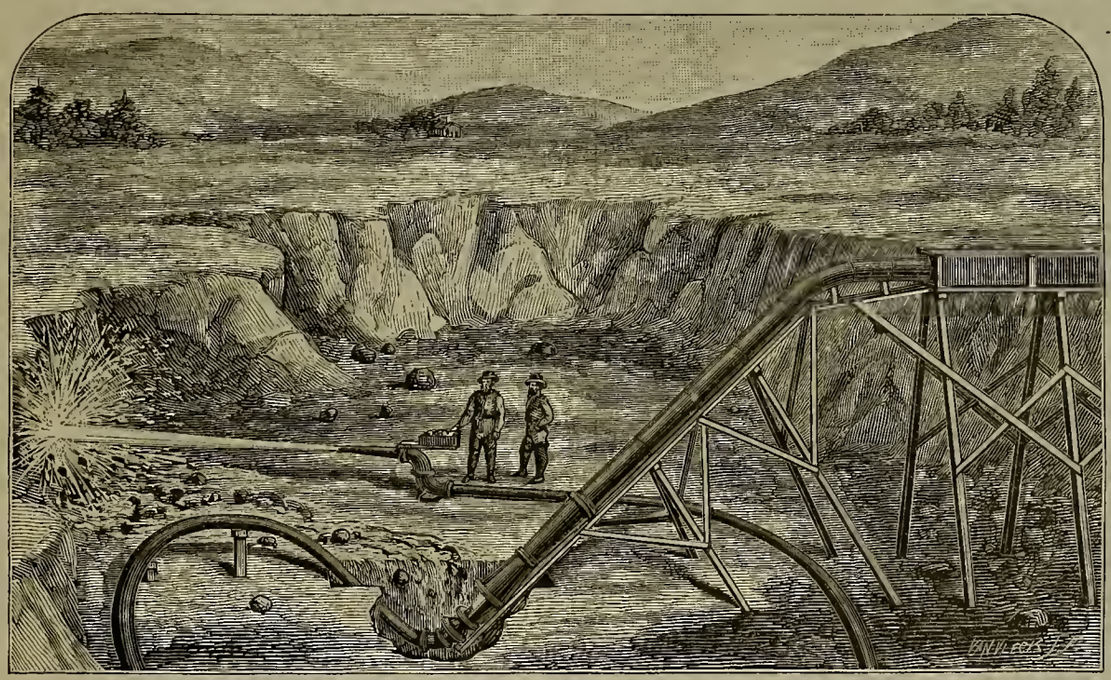
SAN FRANCISCO, SATURDAY, MARCH 11, 1882.

VOLUME XLIV Number 10.

Hydraulic Gravel Elevators.

These machines are simple in their conetruction, having neither helte, wbeele, pulleye, valves nor buokets, in faot nothing to need repair and nothing complicated. They oan be rnn by any one who can run a hydraulio mine. They sluice water and gravel up bill; work deposite that have only a ehallow fall nr dump; save the heavy expense of driving bedrock tnnnels, npen cute or drains; sluice gravel of any dimensione that will pase throngh a flume; and drain all eurplne water flowing from the gravel or on the bedrock; work ae well ae flumee having ten or twelve inchee grade, and will handle as mucb gravel in proportion to the wster need. The engraving ehows the manner of application of this style of elevator.

Their conetruction consists of an iron pipe having n horizontal ground eection and pipe leading therefrom upward at an angle of 45° to an ordinary open flnme lying above and extending beyond the pit, and into which the water and materinl forced through the pipe ie diecharged. Thie horizontal or ground eection ie conetructed with an open end back of or behiod the entrance of the pipe into which the hydranlic nozzel ie directed. The npen end of the ground section ie concave in shape, or a lower half eection of the pipe flaring outward and into which the gravel is elniced or washed by small outeide hydraulic gi n's, throrgh a hedrock flume leading to the Elevator throat or entrnnce; which ie eet below the surface of the bedrock as deep ae possible, whence it ie takeu up by the etream from the hydraulic nozzel fixed at the entrance of the aecending pipe, which, imping ing npnn the gravel, earth or other heavy material forced into the entrance from bebind, impele it forward and upward through tbe pipe to itı point of diecharge into the open flume above the pit or excavation, whence it ie carried away by a line of eluice boxes to a final point of discharge.



METHOD OF WORKING SHALLOW GRAVEL CLAIM WITH HYDRAULIC GRAVEL ELEVATOR.

Confined ae the material is within a tight iron pipe, it ie neceeearily impelled forward with the velocity of the etream iteelf, and ae eaoh particle of gravel or other material is directly acted upon by the full force of this strsam it ie necesenrily conoiderably pulverized by this aotion ae well as by the friction along the pipe in ite aecent, and this dieintegration ie so thorongh and conoiderable that long and expeneive outer flumee leading away from the pipe diecharge are rendered unnecessary.

From the impinging and frictional action of the water and gravel, it ie evident that the greatest amount of wear will be upon the ground section and at the point of curvature of the pipe, and that thie wear will be greater on ite under eection; consequnently the ground eection and curved portion of the pips are constructed in half eections, an upper and lower, with a flange turned out on each eids, eo that the two can be bolted together, and the lower half being worn can be replaced without trouble. In order to withstand thie wear the lower half section is made of the beet white or chilled iron.

These machines can he made of any capacity, and will handle any head of water used in hydraulio mining.

In operating the gravel elovator the primary object is, of conree, to have it perform all the work of whioh it ie capable, snd as it reqnires no more power to raiee a pound of gravel than to raise a ponnd of water, it ehould be tbe eudeavor to pipe as much gravel towarde and into ite entrance as is poesible, as it can rsrely he overloaded. It must be borne in mind that it coete as mnch time and money to run water through the elevator pipe ae it doee earth or gravel, and it requiree equally as mnoh power to raiee the one as the other. When the elevator is properly and advantsgeously eet and operated, the amount of material which can be raised or impelled through the pipe is governed and limited only by the volume and conoequent capacity of the water to osrry tbe material tbrough the outer discharge flume towarde it connection with the onter diecharge flume, thereby obvisting in a large degree the nmount of friotion encountered in the machinee before oonstructed, the radiue of the curvature of the pipe being greater; and further by incresoing the eize of the diecharge opening of the pipe gradnally ae it approaobes the outer open flume.

Theee machines, which are manufactnred in thie city by Joebua Hendy, are in uee in many placee on thie coaet, and have fulfilled the expectatione of purchaeere in enabling them to work ehallow auriferoue depoeite.

towsrd the dump.

It is estimated that 100 feet of hydraulic preeeure will lift 10 feet high; and ae high preseure worke better than low preeeure, 200 feet of preeeure will lift 20 feet high better than 100 feet will lift 10 feet; or whilst 100 feet of preeeure will only lift 10 feet, 200 feet will lift 22 fcet and 300 feet 40 feet. Therefore, with an available head of 300 feet the hydraulic gravel elevator will wash any depoeit 40 feet in depth.

It will be obeerved that eince the earth, gravel or other heavy material which paeses through the elevator pipe neceeearily occupies a certain portion of ite space, and dieplacee a proportionate amount of water, that, therefore, the volume of watsr required to impel the gravel, etc., forward through the pipe will not bs eqnal to the capacity of the pipe, that in fact, not more than one-half of such will he ueed, and that the remainder can he utilized in the mine through the hydraulic nozzele in driving the material towards and into the elevator.

Theee elevatore are built of any required dimsnsione and capacitiee, and many improvemente have recently been introdnced into their construction, which makee the form now manufactured euperior in every reepeot to those which have herstofore been ueed. Theee improvements conoiet in having a larger opening of the pipe at the ground section entrance, which diverges, or ie contracted at the upper end of the eection, thus coutracting the epace through which the material muet paee, and permitting a more direct action or impingement of the etream of water upon it; also in giving a more gradual inclination or upward grade of the pipe

Exhibition of Fossils.

At Mercantile Library Hall on Bueh etreet, in tbis city, ie now on free exhibition, a very large collectiou of csets and foseils, etc., by Henry A. Ward, of Rochester, N. Y. The exhibition is the best and only one of the kind ever seen on thie coaet, and it ie to be hoped it will be kept here through the liberality of eome individual. The collection ehould belong to the Acadeiny of Sciences.

Noticcable among the objecte ie a "reetored" counterpart of the great Siberian mammoth, the remaine of which were found in the ysar 1799, frozen in the ice hanke at the mouth of the river Lena, in Siberis. The skeleton stands in the museum of the Imperial Academy of St. Pstereburg. Alongeide etands the skeleton complste of an elephant of the present day.

Within the rail surrounding thie monster ie n cordon of caste or remaine of ite contemporary monetere. Among theee are the ekull and tueke of a mastodon of the pleietocsne age, exhumed near Newberg, New York; remains of a glyptodon, or moneter tortoiee, found near Uruguay, caet from the original in the muoeum of Dijon, France. One of the moet wonderful representatives of that period of animal mouetroeitiee exhibited here is the caet of a complete skeleton of the megatherium or moneter sloth. The structure of this skeleton denotes prodigioue etrength and a horrible aepect. Beeide these there are caste of skulle of the cavedwellers, the Neanderthal man and other prehistoric racee. The fac similes of the Puehlos and cliff-dwellings of Arizona and New Mexico are specially interesting. The exhibition is open to the public without charge, and no one ehould fail to visit it.

An Important Mining Decision.

Juetice Field, in bebslf of the United Statee Supreme Court, bas rendered a deciein in the csee of the St. Louie Smelting and Refining Co. vs. Kemp and Nuttall, which is of immenee importance to all mining intereete. Thie ie the oaee heretofore referred to as having heeu decided by Juetice Miller in the Circnit Court for Colorado, and taken to the Supreme Conrt on a writ of error for final review. The plaintiff relied for revereal of the Circuit Court judgment upon three grounde: Fiiet, an error in admitting the record of the proceedinge of the Land Office to impeach the validity of the patent issued upon them; secoud, an error in instructing the jury that a patent for a plscer claim eince the Act of 1870, eculd not embrace, in any case, more than 160 acree; and third, an error in instrncting the jury that the owner, by purchase, of sevcral claime muet take separate proceedings upon each ooe, in order to eustain a valid patent, and that it was not lawful for him to proeecute a single application upon a coneolidation of several claims into one, or for the land officere to allow euch an application and to iseue a patent thereon. Justice Field, delivering the decision of the Supreme Court, esid: "We are of the opinion that theee several gronnds are well taken aod that in eeoh particular the court below erred." He then proceeded to deliver a very able and remarkably exhauetive opinion, dieouesing all the various pointe raised, reviewing the entire hietory and purpoee of mining legislation, eetting forth the disastroueconcequences which would result from upholding the reversed deciein, and expounding the doctrinee which the Supreme Court will apply to all eimilar questione hereafter.

An Important Mining Suit.—The Southern Nevada Mining Co., whoee stock was recently lieted on tbe San Francieco Bosrd, have brought euit in the U. S. Circuit Court at Carson againet the Northern Belle Mining Co. to recover $600,000, the value of ore alleged to have beentaken from the Southern Nevada's ground. The new company have, by etipulation of attorneys on both eidee, had official eurveye made by competent eurveyore, and claim that they can prove to a certainty that over 10,000 tone of ore havs been taken within their linee. Their claim at Candelaria was formerly known as Chief of the Hill. Judge J. McM. Shaftsr is Preeident of the Southern Nevada, and R. E. Kelly, formerly of Careon, ie Secretary.

Additional mining pay-rolls for February work have heeu reported as follows: Yellow Jacket, $7,987; Crown Point, $16,019.87; Belcher, $9,375.37; Crown Point and Belcher joint ehaft, $2,356.50; Alta, $6,930; Benton, $3,540; Savage, $11,200; Con. Virginia, California and C. & C. ehaft, $11,303.75; Union, $14,478.

Moved by the tremendous storiee told of the mineral wsalth of New Mexico, a correspondent of the Chicago *Tribune* suggeste Baron Munchaueen for Governor and Eli Perkins for Secretary of that Territory.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Southern Arizona.

Dos Cabezas District.

EDITORS PRESS:—Although this mining camp has never had a "boom," and has not, either by newspapsr articlss or the efforts of effective, full-blown talkers, had as much done for it as some other districts which have richer surface ores, it will, notwithstanding, be heard of in future years, in connection with paying mines.

The Mineral Belt,

(Or rather series of mineral belts) covered by it is very extensive. Its northwesterly end is near Railroad pass, eight or ten miles northeasterly of Willcox station, on the Southern Pacific railroad. From thence it extends southeasterly about 20 miles, to Fort Bowie, its average width being eight to ten miles. The mountains it traverses belong to the Chirricahua rangs, which, at Apache pass, turns from a northerly to northwesterly course. Towards the westerly end of this deflected part of the range, a lofty mountain, with two distinct heads or peaks, visible from points 70 to 80 miles distant, gives the district its Mexican name.

These cabezas, or heads, seen from the railroad, do not look as if they were 120 to 150 ft. above the top of the rocky pile they belong to; but when one is at their base, they prove formidable towers. On the northwesterly side of these peaks is Railroad pass; on the southerly side, rather pleasantly located on a plateau considerably above the level of the valley, is the

Town of Dos Cabezas.

If the great expectations some persons seem to have in respect to the future of this town are to be realized, and its 320 acres of a townsite survey are to be all occupied by buildings, streets, avenues and squares, it will ultimately be a place of much importance. Irrespective of miners in the hills, the town has about 120 inhabitants. It has a hotel, three stores, four saloons, blacksmith and butcher shops, a feed-stable or two, a silent, five-stamp, shortive quartz mill, a good 10-stamp mill just finished, and several cattle corrals, the stock from which range on the contiguous slopes. The substratum is granite, and good water is found everywhere 30 to 40 ft. down. There is little or no dust in summer or mud in winter, and few places surpass it as to healthfulness. There are cooling breezes in summer which keep the thermometer generally, though not always, below 90° in the shade. Perhaps a trifle more of this breeziness is experienced in the spring and fall than is desirable, but then as there are not over 20 days of enforced idleness by bad weather in the whole year, there is no great reason for complaint. The old mail road between Arizona and New Mexico passes through the town, Tucson to the west and Silver City to the east being nearly equidistant—a little over 100 miles.

There is an express and post office, with daily mail, and a recently-started weekly newspaper, called the *Gold Note*, gives us the current news. The population is quiet and law-abiding, and only at times when an extra quantity of cow-boy slickens has been imbibed have we any noise or pistol shooting on our streets.

The Mineral Lodes

Are quite numerous, and some of them are very large. There is a massive east and west quartz vein, the croppings of which are seen from the town, two miles off. It is traceable for four or five miles, and is 100 ft. wide in some places, standing 80 ft. above the general surface. Most of this mass is barren, hard white rock, but there are streaks and veins in it of softer quartz, which carry from $5 up to $40 in gold. Whether these auriferous deposits will increase in average value as shafts go down upon them is something yet to be determined by persistent development. So far, no fair test has been made at sufficient depth to prove anything conclusively, but miners and experts are alike hopeful as to the future of the lode. There is evidently but one great ore channel at this point, although in several places it shows three or four seemingly distinct veins extending over a wide surface. The southerly or footwall rock is diorite, and the hanging wall talcose slate—bounded by a reef of porphyry on its northerly side.

To the north of this mineral zone the formation for several miles is a soft promising granite, covered on the ridges by trachytic porphyry. Here we find a belt of four or five lodes running east southeast and west northwest. They are large and heavily stained with copper. Some of them assay $20 to $40 in gold, a few dollars in silver and 12% to 30% in copper.

Another belt runs nearly due north and south, and has still larger veins. Some of them 100 ft. wide, with the same kind of ores, the assays in gold and silver going higher, however. A third belt has two or three north northwest and south southeast veins, similar to the others as to outcrop. No work of consequence has been done on these lodes in the granite, and all that can be said of them is that, with heavy ore croppings and promising assays, there is a good prospect of mines being found by development, which, if not very high in grade, will at least be extensive, and as true fissures, they will have the advantage of comparative permanency. On the northerly side of the aggregated mineral belts, also in granite, considerable work has been done of late on a series of white quartz veins carrying galena and other sulphurets in blotches and streaks. These lodes have improved so much by sinking on them that confidence in other ledges not yet worked upon has been strengthened. Some of them have good concentrating ores worth from $30 to $60 per ton, and gradually increasing in value with depth, though the despest opening is only some 40 ft.

The Silver Camp,

Lying toward the westerly end of the main belt, also in granite, has a number of small, very rich chloride veins. The ores on the surface were a good deal mixed with porphyry and clay, but 50 ft. down they have become compact and yield 9 to 12 inches of clear ore worth $80 to $300 per ton in bulk, though assays go up into the thousands. As the whole surface is seamed by small veins, it is thought, with good reason, that as depth is attained, large bodies of ore will be found. The work done on these veins has always been paid for by the yield in bullion, and now that a custom mill is ready to reduce their ores, several valuable properties are sure to be opened.

Closing Notes.

From springs and wells the necessary water for milling purposes can no doubt be obtained. Firewood is not plentiful, though there is enough to last for several years of active milling work. Ultimately we will have to rely on coal brought by rail to Willcox station, 15 miles off. If it is once demonstrated, as it no doubt will be, that we have extensive mines which will pay to work, we are sure to get final at moderate prices. Even if reduction works were erected near the railroad, a narrow-gange road to carry the ore to them would soon be provided.

CENDA.

Dos Cabezas, Cochise county, A. T., Feb. 27th.

A New Dry Ore Concentrator.

The dry ore concentration works of Messrs. Thurmond & Hamilton in Russell district, situated in the large stone building between the mouth of Illinois gulch and the stamp mill and wet ore concentrator of the Miners' Sampling Co., is now running. A visit to these works was made yesterday by a reporter of the *Register-Call*, who witnessed the treatment of a quantity of low grade ores from the Clifton mine, in the head of the south fork of Willis gulch. The ore is first thoroughly dried by a furnace, the drier being on an incline. After drying it passes through a Forster improved crusher; from thence the ore passes to Cornish rolls, and thence to a machine 14 ft. in length, 60 inches wide at the top and 7 inches at the bottom, which is set on an incline of 4 inches to every 12 inches. An improved fan blower 45 inches in diameter, capable of being speeded up to 1,600 revolutions per minute, sets at the bottom of the machine or air chamber, the latter having 14 different sets of graduated screens, commencing with those of a fineness of 100 mesh and ending with 16 mesh. The fine particles of mineral are collected at the head of the graduated screens. All ore not passing through a 16 mesh screen is elevated and carried back to the Cornish rolls. The gangue rock or waste material is elevated and passed outside of the building. The principle upon which the work is based is that of specific gravity, or rather a gradated air draft working in conjunction with gradated screens. The concentrated ore is drawn off in two sizes, which are sacked up ready to be sent to the smelters. Samples of the ores are made by means of automatic samplers attached to the gates of the air chamber. The concentration of the ore is controlled by the amount of mineral it contains.

It is claimed by the inventor that, as air is less dense than water, when the law of gravitation is invoked for the purpose of separating particles of metallic from earthy matter, provided that the rise of air can be as effectively and economically controlled and directed as that of water, being a more subtle and less resisting medium than water, these particles can be, and are, more readily stratified and separated than it is possible for them to be in water. The volume of air in the chamber is under control of the operator by means of a lever.

The motive power used is a 40-horse power steam boiler and a 30-horse power Bay State engine. The capacity of the works is 40 tons per day, which can be increased by adding another graduated air chamber, rolls, etc. The work executed thus far by Messrs. Thurmond & Hamilton has given satisfaction, although, for the most part, it has been experimental. With the modifications and added improvements recently made it is predicted that they will meet with that success in the treatment of low-grade ores that has been anticipated for them.—*Central City (Col.) Register.*

THE ÆTNA QUICKSILVER GROUP.—Machinery has been shipped to the Granville Quicksilver mine, near Pope valley, for clearing it of water, which troubles mining operations. A road is to be put through from the Napa Con., or Oat Hill mine, to the old Phœnix mine, opening up a highway direct from Pope valley to the St. Helena Mountain toll-road. The Ætna Mine boarding-house is run by the Snow family, late of Middletown. The principal mining is now being carried on in the Star Quicksilver mine. Some of the shareholders and parties interested will visit the group of mines embraced in the old Phœnix district this spring, when it is expected extensive mining operations will be entered upon, and the old camp be stimulated into new life and development.—*Cor. Calistogian.*

Miners' Lamps.

The New Tin Can (Davy) Safety Lamp.

At a recent meeting of the Manchester Geological Society, at Wigan, a very interesting discussion took place concerning miners' lamps, which is reported in full in the *Colliery Guardian:*

Mr. H. Hall, Her Majesty's Inspector of Mines exhibited and described specimens of the new tin can (Davy) safety lamp, which consists of an ordinary Davy lamp enclosed in a tin cylinder or lantern, perforated at the bottom for the admission of air and open at the top, the light given by the lamp passing through a square glass window on one side in one lamp, and through a circular glass passing all round the lamp in another. No doubt, Mr. Hall said, all who were present at that meeting were acquainted with the elaborate tests which had of late been carried out with safety lamps in that and other districts. These seemed to have proved indisputably that many of the safety lamps at present used were safety lamps only in name, and the days of their old friend Davy seemed to be doomed. He was, however, happy to be able to produce before them that day a Davy lamp improved in a certain way, which judging from the experiments that had been made, seemed to be the safest lamp that could be obtained. It had, he was told, been subjected to 1,800 cubic feet of explosive mixture per minute passing upon it, as well as to a variety of other tests, and during the whole of these tests it had never been found to fail. By simply placing an ordinary Davy inside a tin lantern, they had a lamp which was doubly locked, and the outer tin shield not only prevented any current of air affecting the lamp, but also provided an additional safeguard against accident, as in the event of a miner striking the lamp with a pick, the injury would be received by the shield instead of by the lamp itself. So far as his own experience went he preferred the lamp with one glass in front, because it could be more readily held in the hand without feeling the heat. So far as drafts were concerned, he had tried the lamp under most tremendous pressures of air without any material effect. These lamps had been introduced into Durham in thousands, as well as into the Seaham and other collieries. He hoped therefore that the Lancashire people, if they approved of the lamps, would not be slow to adopt them also. He did not know that any one could claim the invention; it was not patented, and it seemed to him rather as if some boy had had an ordinary Davy lamp, and had contrived the outside tin cylinder as a shield to keep his light from being blown out.

Mr. Wm. Smethurst said he understood Mr. Hall to state that the tin can Davy was an absolutely safe lamp. Under certain conditions it was, but he must take exception to the conclusion that it had never been known to fail. It was known to fail where the perforated holes were put too high up. If they were put too high up the air current would have much the same effect as upon an open lamp. One objection to the lamp was that being enclosed in a case it was in a perfectly still atmosphere, and the dust getting inside the lamp casing, covered the lamp, and the small light it gave was thus still further reduced by the covering of dust. The Mueseler lamp, if constructed in a proper form, would undergo the same test, and putting the Davy lamp into a tin case, as shown, rendered it comparatively speaking a safe lamp, taking care of course that the holes were not put too highup. If they took a Mueseler, and instead of a single disk, a double disk was placed for the chimney to rest upon, then they had a safe lamp. An objection had been raised to the Mueseler, that it it were held on one side it went out, but considering how they had to depend upon the protection of the glass, he thought this, instead of being an objection was rather in favor of the Mueseler. He thought the tin can lamp would be open to the objection that when the glass became covered with dust, the collier would try by some means to get through to see if he could not wipe the glass, whilst if they had glass all round they increased the liability of its being broken. Under any circumstances, however, they reduced the light to a certain extent. Something, however, ought to be done with regard to the lamps at present in use, and especially when they considered how unsafe the ordinary Davy lamps were with the present system of ventilation. The sooner government or they themselves took the matter in hand the better. He would, however, prefer that the government took the matter up, because no one man could do it in a district, as the men, if they did not care to use the lamp would leave the colliery and go elsewhere. If government would say that such and such lamps must be abandoned—he did not say which lamps should be used—they would have a better lamp. In the tin can lamps which had been shown it was essential for their safety that the perforated holes should be kept below the standards so that the current could not be brought against the gauze. They had Davy lamps at present in use in most of the collieries, which, taking into consideration how very short a time such a lamp was safe in an explosive mixture with anything like a high velocity of air current, were rather startling. And then their opinion as to the amount of gas required to cause an explosion had been considerably altered by actual experience. In former days 12½% of gas was considered the most explosive mixture, but from actual experience they found that 3½% was quite sufficient, and with coaldust 3½% would be enough to cause an explosion. So that if they would take into consideration how small a quantity of gas it took to cause an explosion it was essential that every effort should be made to bring forward a lamp which would be safe under these conditions, and which ought to be used. The lamp which had been exhibited was a step in the right direction, and it was the best method of making a Davy lamp safe.

Mr. William Pickard (formerly miners' agent in the district) said that, viewing the matter from a working man's point of view, he hoped that in considering the best safety lamp to be adopted they would not overlook the question of usefulness. The Davy lamp, he thought, was already quite dark enough to be put into the hands of a workman without surrounding it with further complications in the shape of a casing in which the dust would lodge, and still further impede the light. What they wanted was an invention which would secure safety and at the same time give the collier light; a lamp that would not allow the man to work in gas, but, in the second place, would give him light in safety. In the tin can Davy, he thought that while they were protecting from danger in one extreme they were rendering it liable to danger in another. He quite agreed that the Davy lamp, as at present in use, was, as had been abundantly proved, not safe; but he did not think that surrounding it with a tin cylinder, in the form that had been shown, was giving greater safety to the lamp, and, certainly, it was not giving greater facilities for light. From the working men's point of view, he would ask them not to take into consideration the use of these lamps in the Lancashire coal mines.

Mr. C. F. Clark was in favor of a lamp that went out immediately it came in the presence of gas. No lamp would be safe that did not go out in an explosive atmosphere, and, considering the dangers they had to contend with underground, he thought their attention ought to be directed to improving the lamp so that it might be made to go out immediately in the presence of gas. Any other lamp would be always liable to accident, however safe it might be. He thought a lamp that went out in the presence of gas would satisfy the workmen much more than by giving them one which would enable them to work in a mine half full of explosive gas.

Mr. W. Topping said he had long been of opinion that a Davy lamp, with the circular glass shield, was the safest lamp produced, and they had introduced the circular glass shield lamps into their most "fiery" mines. One objection to these lamps had been the liability to the breakage of the glass, but the one encased in tin, as shown by Mr. Hall, was a perfect shield from any current or draught in which the lamp might be placed. If it could be proved that the ordinary Davy lamp, placed in a tin can, could give out as much light as the Davy lamp unprotected, he should certainly say it was by far the most suitable lamp yet invented. A lamp was intended for light, but they wanted a lamp which would not only enable them to do their work, but which would also afford the means of determining the nature of the atmosphere with which they had to deal, and give them such light as would enable them to walk out of the danger. His experience, during the last few days, of the tin can lamp had been such as to convince him that it was one of the best lamps ever invented, and with regard to the dust, he had not seen, as yet, that it had been any defect. With the view of testing what current was likely to affect the lamp, he had allowed the full force of all the air coming down the pit to come in contact with the lamp, and the result had been to convince him that in any hurricane it would live.

Mr. Teale said this lamp had been in use in the pits of the North for some time, and he thought the tin shield was originally designed more with the view of protecting the lamps from injury. He thoroughly believed that collieries could be properly and well lighted, and, he might say, almost with perfect safety. They had only to get over some primary difficulties—arising, in some cases, from prejudice, and in others from custom—and he had no doubt they would have a better lamp in the mines. If the intention was to have a thoroughly safe lamp the tests to which it would be submitted should be stated, and then they might arrive at what they considered the best lamp for the purpose. He did not, however, think the tin can arrangement was so safe as it was imagined to be.

Mr. Wm. Smethhurst observed that if they had to have perfect safety in their mines with regard to lighting, then the enclosed Davy was fit only for the underground managers and the firemen who went to examine the places. It was not fit for an uneducated man; for such a man, let him by all means have a lamp that went out. The Mueseler could only be fired in one way. So long as the current kept straight in one way they could not explode the lamp; it could only be fired by suddenly reversing the current. If they had a double disc and narrow top to the chimney they would have a perfectly safe lamp.

THE Castle Doms mines are hooming and hoisting immense quantities of metal. These mines have made more money in proportion to capital expended than any other group of claims in Arizona.

THE Lodi mill, at Silver peak, is being moved a short distance, and will be put in running order in a short time. It has five stamps.

MECHANICAL PROGRESS.

Belting Leather.

In the manufacture of belting the selection of leather is of the utmost importance. The hides of grass-fed prairie cattle furnish a good material for belting leather, and these hides are, as a rule, superior to those of stall-fed Eastern cattle, the fiber being more compact and solid, and producing leather less liable to stretch. The best hides for the purpose are those taken from cattle four or five years old, as the hides of animals of that age have not been subjected to the stretching and shrinking, resulting from changing condition, as have the older ones, and the leather is consequently more apt to remain straight. In fact, perhaps the best and cheapest belt in the world is made from the hide of a four or five-year-old bullock that has been fed on grass, the hide thoroughly bark-tanned, and a long time allowed for the process.

The belt manufacturer has one important disadvantage to contend with. Along that portion of the hide over the backbone, full or humpy places are frequently found, caused by the shape of the animal, and it is often difficult and sometimes impossible to make them flat; hence the belt retains the unevenness through its centers, and refuses to properly hug the pulley. The following rules are given for the avoidance of this difficulty.

In making a wide double belt the hides should be cut along the middle, the back edges should be outward and the side edges inward, a side center piece being inserted in order to break joints widthwise. In three-ply belts the same method may be adopted. The advantages gained are the following: The edge portions of the belt being firm, solid and unyielding leather, and the middle portions of looser texture, it is reasoned that after running a short time the middle will "give" to the higher part of the pulley, and the edges will not only hind down, but will also afford a lateral support which will relieve the tension of the middle and insure an even bearing the whole breadth of the belt. Again, when the middle of the belt becomes stretched and allows the edge portions to bed themselves down to the pulley, the working strain will be distributed over the entire width. Lastly, it will, no doubt, be noticed that cutting down the middle of the hide enables the currier to work out, with the greatest ease, any uneven or full places, the surplus being cut away in the process of straightening.—*Boston Jour. of Com.*

Practice vs. Theory.

Mr. James Abernathey, in an article on this subject, says: It matters but little how practical the inventor, designer or builder may be, his efforts are deemed theoretical until they have been tested at work. This is especially true with makers of machines combining a number of different and simple elements or principles. All may be satisfied that each of the elements independent of the others is well understood and all right, but are not satisfied that the combination will work all right until it has been tried, and well tried. After a trial has been made and proven successful, all ideas of theory in connection with it ceases, and it is accepted as practical. Other machines, built precisely like the first, and for the same purpose, are accepted without question. And there is really no question about the practicability of larger or smaller machines built on the same general plan and for the same purpose.

It is true that practical men make mistakes. All classes of men do that; but it is a thousand times safer to have a good practical knowledge than have none at all. And I would like to say right here to all young beginners, as they learn practically, to also contract a habit of thinking; learn to trace the workings of causes to their effects, and effects back to causes. In other words, become students, and continue to be students. If you run into difficulties, think and study yourselves out. It will pay you in the future, and be of inestimable value to mankind. The writer has always been a student, and is a student to-day, but has been by no means as studious as he should have been; much valuable time has been wasted, and an ignorance of many things of which he should have been well informed now stares him in the face.

A NEW USE FOR SPENCE'S METAL.—The material known as Spence's metal is composed principally of iron pyrites, and has the properties of melting at a low temperature and cooling very rapidly, thus enabling it to be cast in gelatine molds, by which process the most elaborate carving can be accurately reproduced. A perfectly sharp casting can be obtained by pouring this metal at a temperature of 250° F. into a gelatine mold which melts at 90°. Chilled at once, the metal forms a hard skin before the gelatine has time to melt. The heat of the metal will, after some time, melt the mold, too late, however, to injure the casting. When taken out of the mold, the metal has much the appearance of black wedgwood, and is susceptible of the same amount of polish. Statues and bas-reliefs of any size can be cast with accuracy, and the finest work, such as the plate of a steel engraving or the carving of a Chinese card-case, can be exactly reproduced. Its capability of withstanding exposure to the weather renders it very suitable for the decoration of architecture.

Close-Fitting Fire-Doors.

It is a somewhat common notion that air-leaks around the doors on a boiler front, or through the brickwork, or in the flue-cover plates at the back end of the boiler, do not amount to very much in the cooling effect which they produce. It may be hard to say, in exact figures, what this cooling really amounts to, for the measurement of the quantity of air thus needlessly admitted is by no means an easy thing. The area of the crevices may be readily enough determined, but to get the actual or the average velocity of the flow through them is far from a simple process. A useful comparison may sometimes be made of this leakage area with actual clear area between the grate bars, and in some cases that could be cited this proportion would be found surprisingly large.

The utmost care should be taken when test trials are to be made, that all such leaks of cold air are stopped (and most properly, too), in the same way that search is made for steam-leaks about an engine, and for air-leaks into a condenser. It is too often the case, though, that when the test trial has been finished this rigid care is laid aside, apparently upon the ground that as the high results of a closely watched test can never be reached in everyday work, therefore no special pains whatever need be taken, either for careful fixing or for exact conditions of apparatus.

The fact cannot be denied, however, that there is money value, and in a year's time a good deal of it, in the maintenance of the very best conditions of things, in all the particulars of which the close-fitting fire-door may be taken as the type.

A boiler is fired for the purpose of heating the water in it, and every ounce of air that passes into the boiler-setting, through leaks of any kind, involves a waste as much as though an equal weight of sand, or any other useless material, were poured in and heated up. This leakage of air, it must be remembered, is constant—all the time running—and even a slight opening in the wall or against one of the front plates, will pass wastefully in the course of a week enough air to represent a very snug little sum in the bills which must be paid for coal. This leakage flow of air into a boiler furnace, it should be remembered, is a very different thing from the admission of air above the fire by an exactly regulated slide or similar device, although even this admission is too often recommended and made in ways that are simply absurd, and which lead to as palpable waste as leaky doors or rickety walls can ever cause. This branch of the subject is supposed by some to be quite complex, and is not often dismissed with few words.

A NEW-STYLE STEAM PRESS FOR FORMING AXES.—The *Daily Times*, of Chester, Pa., says: "The large steam hammer or press at the Beatty Axe Works, on Second street, this city, H. B. Black, proprietor, mention of which was made some months ago in this paper, is now about completed, and is expected to be in working order in a day or two. It is an immense piece of machinery, weighing 13 tons, and capable of making a hatchet, adze or broad-axe in a remarkably short space of time. Its working is somewhat complicated. Dies are used according to the shape of the tool desired. In these dies a piece of iron of the proper weight is put, and by intense pressure the iron is reduced to the desired shape. By an ingenious arrangement the iron is "steeled," that is, the required piece of steel is welded to it by pressure from four directions. It is again placed in the die and repressed and the "eye" punched. A man then takes it, points it, and dresses it up ready for the market. This machine is expected to turn out 24 dozen hatchets per week, and a man could not make more than 10 dozen in the same length of time. It is also used for cutting iron, in which it is the means of saving much labor. A heavy knife is put upon the machine, and it will make a clean cut through a piece of cold iron 2¼ by 1½ inches. There is no other press in the country like this one. It was invented and patented by William Evans, employe in the works, and gives promise of becoming a valuable piece of machinery about an edge-tool works, on account of its speed, which always cheapens productions. Mr. Evans has been a long time perfecting it."

SLIDE VALVE AND LINK MOTIONS.—It is a somewhat remarkable fact that the common slide valve and the link motion, both having been introduced in the early days of the steam engine, remain substantially as they were originally invented. We have, it is true, the Joy and the Marshall valve gear, which are being introduced and may in time supersede the usual style of link motion, but such is not at present the case. Again, in the case of the D slide valve, circular valves have been employed to some extent, and are considered by those who have employed them as giving better results than the ordinary D form. Also we have the Allen valve which is considered to be superior to the common form, and which, strange to say, although an American invention, is probably more in use in English than in American practice, having been applied to many English locomotives. The numerous rotating slide valves that have been devised have universally proved failures, and other forms of valve in which a circular surface is employed require much more care and attention in order to keep them steam tight than is the case with a flat surface.—*Industrial World.*

SCIENTIFIC PROGRESS.

Power of the Microscope.

The magnifying power of the microscope has been brought by modern improvements to about 100,000 diameters. There is a difficulty in determining the exact degree of magnifying power exerted, the only method of comparison being "the apparently barbarous one of placing one eye to the instrument and looking at a finely graduated plate of known dimensions, and looking with the other eye at a common foot-rule at a proper distance for ordinary sight, and with practice bringing the objects together in the field of view."

It has been found that in microscopic observations the use of the electric light makes it possible to illumine at least 500 times stronger than with gas, and that in other important respects the new light is far superior to the old. By what is known as Clevalier's method, the light is separated by its difference in refrangibility so that the heat rays are nearly excluded, and only the luminous rays thrown on the objects to be examined.

Bold as the attempt may seem, microscopists have undertaken, by means of the extremely minute observations they are now able to make, to estimate the size of the ultimate elemental particles or atoms of which all matter is composed. This measurement has not as yet, it is true, been made with exactness; but it is claimed to be well ascertained that these ultimate particles cannot be over one twenty-millionth of an inch in diameter. The startling belief is expressed that the common house-fly is able to see and distinctly recognize these inconceivably minute particles, its eye having been found equipped with a peculiar circular muscle, unknown to early entomologists, which enables it to so change its focus and apply its lenses as to attain this incredible visual power.

The most skillful microscopists, with their most effective instruments, are able to examine the form, color and nature of monades one hundred-thousandth of an inch in diameter, which is a long way off from the delicate precision above indicated, but still can hardly be called a coarse or clumsy way of investigating material phenomena. The best of human eyes, without artificial aid, can see no objects much smaller than one three-hundredth of an inch in diameter.—*Mechanical News.*

What is Materialism?

Materialism is a form of belief, or mode of thought, which in all things prefers to rest on the evidence of the broadest impressions of physical sense, and which suspects, where it does not deny, the reality of aught that cannot be brought to the test of sense impression. It objects to advancing beyond the primary elements of consciousness; and any steps which it takes in the region of mental or moral phenomena, it takes grudgingly, and with a constant dread lest it should be led to recognize as real anything that cannot be *felt* as we feel sticks and stones. The materialist has to live as other men, and, where his theories are not at stake, he will use ordinary human language as freely as others. He will talk of hope and fear, of love and hatred, of ambition and apathy, of honor and disgrace, of character and motive and principal, as if he knew what he meant, and as if the words he used answered to certain realities of human life. But once touch his theory, and he will seek to drain these words of all meaning, or else fall back upon vague talk about "modes of matter."

Materialism is the refuge of minds that have been immaturely freed from spiritualism, or perhaps we may more fitly say, spiritism. By spiritism we mean that undeveloped condition of the mind in which hypothetical existences are required at every turn to account for observed phenomena, in which the mind cannot bear to be left alone with facts. The child learning to walk holds by its mother's finger; the mind learning to think uses such hypotheses as it can construct, and for physical acts it frames spiritual antecedents. The child who thinks it can walk before it really can, and leaves its mother's finger, finds itself compelled to creep along by the wall. In like manner, the materialist who has let go his spirit hypotheses, is compelled to creep along by the wall, to rest upon something *hard*, in order to steady his steps. Divert his attention, and he will walk for awhile with his hands free; but remind him where he is, and he totters back in a moment to his tangible support.—*Popular Science Monthly.*

MAGNETIC BRICKS.—It was lately observed by Herr Kepner, at Salzburg, in the Tyrol, that some old bricks had an attractive or repellant force on a compass. From each of eight varieties of clay in the neighborhood two bricks were molded, and one of the two in each case was baked. The unbaked bricks had no action on a magnetic needle, but seven of the eight baked bricks proved polarly magnetic. Some further experiments have been made by Herren Kell and Trientl. Particles of powder of the magnetic bricks adhered to a steel magnet. Breunerite, mica-slate, argillaceous iron-garnet, chlorite and hornblende were, before heating, unmagnetic, but intense heating produced a magnetic polarity, the axis of which seemed to be perpendicular to the plane of stratification.

Animal Combustion.

Within every living organism there are two opposing forces. The "vital force," which produces all the phenomena of life, holds the material elements in unstable relations, against their will, so to speak, and it is antagonized by the natural chemical affinities of the elements, which tend to break down the organic compounds and re-arrange the elements in more stable form. This decomposition takes place in some degree during the life of every organism, and when life ends, or when the vital force ceases to act, it rapidly destroys the structure.

The waste matter resulting from this disintegration must be immediately removed from the body of the living animal, otherwise it clogs and poisons the system. The method of its accomplishment is one of the most admirable functions of the animal economy. To remove the effete matter in the natural liquid or solid state would be very exhausting; consequently it is burned, and the gaseous products of its union with oxygen are then easily carried away. Literally speaking, this makes a furnace of the body of every animal; and the most pressing and ceaseless demand of the system is for oxygen to support its fires. Respiration is hence an absorbing and excreting process, whereby oxygen is received and carbonic acid and water removed. It thus becomes a measure of the amount of combustion.

In the "cold-blooded" animals, respiration bears a direct proportion to the activity and the heat of the body, as the former causes a metamorphosis and waste of tissue, and the latter always aids decomposition. The fact is one of common observation. It is well illustrated in the quickened breathing of a tired animal, and in the almost entire suspension of respiration in the hibernating state. The respiration of a "cold-blooded" creature is increased by artificial heat. In extremely hot weather, frogs may have to leave the water entirely, and fishes come to the surface to procure air. Reversely, frogs can be kept for years in a state of suspended animation by a low temperature, and revived by warming. Some low animals can survive freezing or drying for an indefinite time; and, under such conditions, the waste of the tissues must be entirely suspended. —"*How Animals Breathe*," *in Popular Science Monthly.*

ELEVEN SCORE ASTEROIDS.—The number of asteroids that have been discovered is now 220. Recent researches by Herr Hornstein (communicated to the Vienna Academy) appear to prove that the number of those with a diameter of over 25 geographical miles is extremely small, and that probably all such were discovered before 1859. On the other hand, the number of asteroids with a diameter less than five miles seems also to be very small, at least in the parts of the asteroid zone next Mars; in the outer regions next Jupiter there may be a more considerable number of these very small bodies. Most asteroids seem to have a diameter between five and 15 miles. The average number of asteroids with a diameter of 5 to 10 miles discovered annually within the last 20 years is about three; the number of those of 10 to 15 miles diameter about 16. Thus, should no telescopes more powerful than the present ones be used in future search for those bodies, we may expect but a moderate "find" of asteroids with diameters under 5 or over 15 geographical miles, while a considerable increase of those with diameters of 5 to 15 miles may be looked for. It further appears that in the case of the smaller asteroids of 5 to 10 miles diameter the improvement of optical instruments and star maps has resulted in no great increase of annual discoveries in the inner zone; such an increase is observed only in the outer zone. Within certain zone limits there is an increase of the average number of yearly discoveries with the time and with distance from the sun, but beyond the outer limit this increase ceases.—*London Times.*

COMET SEEKING.—The number of comet seekers is so few, compared with the amplitude of the tracts of sky to be explored nightly, that it is probable that many celestial visitors escape detection. Several observers may be simultaneously at work upon one region, while larger areas may be left entirely unexplored. To prevent such unintentional waste of time and labor, the *Science Observer* suggests a mapping out of the heavens and an allotment of special tracts to particular observers, who shall agree to explore them nightly. This wise plan is accompanied by a condition which, it strikes us, is not so commendable; and that is, that each recipient of a tract of sky for comet hunting shall agree not to trespass on the preserves of the rest of the comet seekers. It is quite proper to pledge a man to work his own field thoroughly, but if he has time and inclination to do more, why shouldn't he? And what is more likely to spur on a comet seeker to the ample and thorough sweeping of his sky tract as the thought that if he misses a comet his neighbor may chance to find it, and so convict him of negligence or incapacity?

ADJUTANT-MAJOR GAUMET, of the 27th Regiment of France, has patented an instrument which he calls a "telelogue," for signaling purposes. The signals consist of the letters of the alphabet and figures silvered on a dead black ground, and these are illuminated at night by lamps with strong reflectors. A powerful telescope is the receiving instrument. For signaling to a distance of two and a half miles the whole apparatus need not weigh more than five pounds.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Feb. 16.		Week Ending Feb. 23.		Week Ending Mar. 2.		Week Ending Mar. 9.	
Alpha	2.10	1 80	1½	1.40	1.70	1	1½	1.10
Alta	4.40	3	3.95	3.10	3.20	3	3.35	2.70
Andes	65c	50c	50c	45c	50c	35c	75c	45c
Albion	2½	1.90	1.95	1½	2	1.85	2 90	1.80
Argenta	....	....	....	....	....	....	....	....
Addenda	....	....	....	....	....	....	....	....
Belcher	1.05	55c	70c	45c	1.00	55c	60c	23c
Belmont	70c	....	....	....	60c	40c	50c	....
Best & Belcher	7½	6½	6½	6½	6½	5½	6½	6
Bullion	85c	45c	75c	60c	1.20	60c	95c	65c
Bechtel	....	....	40c	....	....	....	35c	30c
Belle Isle	....	....	....	5c	....	....	....	....
Bodie	3.40	3	3½	2.95	3.90	3	4 80	4.35
Benton	75c	65c	85c	70c	70c	60c	60c	50c
Bulwer	....	....	2½	2.40	2.40	....	2	1.85
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	....	....	100	....	....	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	20c	15c	10c	....	15c	10c	....	....
California	20c	10c	35c	10c	25c	20c	45c	30c
Challenge	40c	....	50c	....	....	....	40c	....
Chollar	1.35	1.05	1.20	1.05	1.20	....	1.20	1.05
Confidence	1½	....	1½	1.10	1.40	90c	1	....
Con Imperial	10c	....	10c	....	10c	....	10c	....
Con Virginia	70c	50c	65c	45c	50c	30c	95c	75c
Crown Point	75c	55c	65c	40c	45c	35c	40c	25c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	80c	....	....	....	....	....	70c	....
Concordia (Wa)	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	5c	....	30c	....
Derbec	....	....	....	....	....	....	....	....
Day	85c	80c	85c	....	1.30	85c	1¼	....
E. Mt. Diablo	45c	35c	40c	37c	31c	....	30c	25c
Eureka Con	12½	11½	13	12½	13	12½	16½	13½
Exchequer	75c	55c	70c	45c	60c	35c	60c	40c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	2	1.90	....	....	....	....	....	....
Goodshaw	50c	30c	50c	47c	40c	....	40c	....
Gould & Curry	3.40	2.9	3.45	3.15	3.35	2.85	3.35	3.05
Hale & Norcross	2½	1	1.70	1½	1.60	1½	1.55	1.05
Head Center	15c	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	5c	....	25c	....	90c	....	25c	....
Justice	95c	75c	90c	70c	75c	70c	70c	65c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	80c	....	....	....	70c	15c	....	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	11c	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	1½	....	1½	1½	1½	....
Martin White	4.60	4.10	4.45	4.05	6	5½	7½	....
McClinton	10c	5c	....	....	....	....	....	....
Mono	1	95c	1	90	1.60	45c	1.45	1.35
Mexican	10½	8½	9½	8½	10	8½	9½	8½
Mt. Diablo	7½	6½	7½	6½	6⅝	6½	6⅝	6½
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	30c	20c	....	....	25c	20c	35c	30c
New York	....	....	....	....	....	....	....	....
Northern Belle	11	9½	10½	9½	10½	9½	10	9½
North Noonday	....	....	....	....	25c	....	30c	....
Navajo	60	40c	....	....	35c	....	....	....
Occidental	....	....	60c	....	80c	75c	....	....
Ophir	5½	4½	4.80	4.10	5	3.80	4½	3½
Original Keystone	....	....	....	....	....	....	....	....
Overman	1.10	65c	60c	55c	55c	45c	55c	40c
Oro	30c	25c	25c	20c	35c	25c	40c	30c
Paris	....	....	....	....	....	....	....	....
Potosi	1.30	1.05	1.20	1	1.15	90c	1.10	85c
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.85	1½	1.65	1.35	1¼	1½	1.40	1
Seg Belcher	4.05	3	....	....	1¼	1	2.40	1.60
Sierra Nevada	8⅞	7	7⅞	6½	8⅝	6	8⅝	7½
Silver Hill	....	....	5c	....	....	....	....	....
Silver King	19	18½	18⅞	18⅜	18½	18⅛	18½	16⅝
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	90c	70c	75c	65c	90c	65c	90c	....
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	25c	15c	....	....	25c	20c	....	....
Tioga Con	25c	20c	20c	10c	....	....	30c	25c
Tiptop	....	....	4½	4.10	4.20	....	....	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	11½	9⅞	10⅝	10½	11⅝	9⅝	11⅝	10⅜
Utah	5½	4.95	5½	5⅜	6½	5	5⅝	4⅜
Ward	3.70	3½	....	....	3½	....	....	....
Wales	85c	70c	55c	50c	60c	....	55c	50c
Yellow Jacket	2.05	1½	1.65	1	85c	65c	70c	20c

Sales at S. F. Stock Exchange.

Thursday A. M., Mar. 9.

120	Alpha	1.10	
650	Alta	2.85@2.70	
570	Andes	75@7c	
90	B & Belcher	6	
810	Belcher	65@60c	
450	Bullion	70c	
255	Benton	50c	
140	California	35c	
720	Con Virginia	80@85c	
40	Chollar	1.05	
550	Crown Point	25c	
200	Confidence	1	
255	Exchequer	40@45c	
350	Gould & Curry	3.05	
390	Hale & Nor	1.05	
150	Justice	65c	
350	Julia	20c	
195	Mexican	8⅜@8⅛	
305	Ophir	3.55@3⅝	
100	Overman	40c	
40	Potosi	1.05@1	
100	Savage	1.05@1	
750	Sierra Nevada	7⅛	
5	Seg Belcher	1.60	
240	Scorpion	70c	
240	Union	10⅛@10⅜	
1130	Yellow Jacket	20@25c	

AFTERNOON SESSION.

625	Albion	2.60@2⅛	
100	B O'Neill	75c	
50	Bechtel	35c	
100	Day	1¼	
1750	E Mt Diablo	25c	
100	Eureka Tunnel	1 55	
200	Gen. Jackson	80c	
100	Goodshaw	35c	
250	Mono	1.50	
1500	Navajo	30c	
200	Noonday	40c	
200	N Noonday	40c	
460	Oro	35c	
100	Pinal	3.35	
50	Southern Nev	52	
50	Silver King	17⅛	
250	Wales	50c	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Standard, Feb. 27th, $2,043; North Noonday, 28th, $6,925; Noonday, 28th, $6,925; Star, 24th, $3,506; Christy, 27th, $4,458; Northern Belle, 27th, $6,790; Mt. Diablo, 28th, $6,283; Eureka Con., 27th, $607; Eureka Con., March 1st, $3,726; Bodie Con., 6th, $7,998; Mt. Diablo, 4th, $9,408; Northern Belle, 2d, $7,800; Mt. Diablo, Feb. 24th, $8,200; Contention Con., $19,030; Silver Reef for February, $52,676; Hanauer, March 1st, $5,500; Horn Silver, 1st, $30,000; Tiutic, 3d, $4,546; Starr Grove, 4th, $4,000; Horn Silver, 4th, $10,000; Bullionville, 4th, $6,438; Barbee & Walker, 4th, $1,705; Hanauer, 4th, $2,250; Nevada, 4th, $3,100.

ALTHOUGH none of our mills are running at present, says the Tuscarora *Times-Review*, work in the mines progresses as usual, and considerable ore has accumulated. In a number of our mines leases have been taken by miners who do not care to fool away their time idling about town. Some are taking out rich ore, and all appear to have excellent prospects ahead.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes S M Co	Nevada	18	25	Feb 2	Mar 9	Mar 30	B Burris 309 Montgomery st
Belcher S M Co	Nevada	29	50	Feb 6	Mar 11	Mar 31	J Crockett 327 Pine st
Belvidere M Co	California	13	25	Feb 9	Mar 14	Apr 3	C Y D Hubbard 310 Pine st
Bullion M Co	Nevada	22	30	Jan 19	Feb 21	Mar 14	J M Brazell 328 Montgomery st
California M Co	Nevada	2	20	Jan 18	Feb 25	Mar 22	C P Gordon 309 Montgomery st
Champion M Co	California	10	25	Jan 12	Feb 20	Mar 13	B Burris 309 Montgomery st
Con Pacific M Co	California	4	25	Jan 26	Mar 3	Mar 27	F E Luty 330 Pine st
Con Virginia M Co	Nevada	17	30	Jan 31	Mar 11	Apr 8	A W Havens 309 Montgomery st
Crown Point G & S M Co	Nevada	47	25	Feb 16	Mar 23	Apr 13	J Newlands 327 Pine st
Day S M Co	Nevada	10	50	Jan 28	Mar 6	Apr 3	E M Hall 327 Pine st
Equitable T & M Co	Utah	26	10	Feb 2	Mar 9	Mar 24	G J Collins 512 Montgomery st
Fall Creek M Co	California	5	30	Feb 16	Mar 24	Apr 19	W Willis 309 Montgomery st
Independence M Co	Nevada	9	15	Feb 24	Mar 31	Apr 24	E M Hall 327 Pine st
Julia Con M Co	Nevada	17	20	Jan 17	Feb 24	Mar 16	H A Charles 419 California st
Martin White M Co	Nevada	11	25	Jan 20	Mar 2	Mar 30	J J Scoville 309 Montgomery st
Mayflower Grav M Co	California	15	10	Mar 7	Apr 11	May 3	J Morizio 328 Montgomery st
McWillen M Co	Arizona	4	30	Feb 8	Mar 14	Apr 12	J Morizio 328 Montgomery st
Modoc Con M Co	California	10	30	Feb 14	Mar 28	Apr 25	J W Pew 310 Pine st
Mono G M Co	California	16	30	Feb 7	Mar 14	Apr 3	W H Lent 309 Montgomery st
Napoleon M Co	California	2	03	Feb 18	Mar 23	Apr 8	B Smith 309 Montgomery st
New York M Co	Nevada	27	15	Jan 18	Mar 7	Mar 23	F E Piltz 327 Pine st
Ophir S M Co	Nevada	41	1 00	Mar 7	Apr 8	May 2	C L McCoy 309 Montgomery st
Pinal Con M Co	Arizona	2	30	Jan 24	Mar 7	Apr 3	W W Traylor 309 Montgomery st
San Jose M Co	Nevada	18	75	Jan 30	Mar 15	Apr 19	A Carrigan 109 Front st
Savage M Co	Nevada	50	50	Mar 7	Apr 10	May 1	E B Holmes 309 Montgomery st
Seg Belcher M Co	Nevada	21	1 00	Feb 14	Mar 20	Apr 10	G D Edwards 414 California st
Silver Hill M Co	Nevada	17	15	Feb 2	Mar 9	Mar 29	W E Dean 309 Montgomery st
Spaulding G & S M Co	California	2	10	June 23	Feb 23	Mar 24	J W Pew 310 Pine st
Yellow Jacket S M Co	Nevada	44	1 00	Feb 7	Mar 4	Apr 11	M Otey 327 Pine st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Bay State S M Co	Nevada	1	02	Dec 29	Mar 31	Apr 24	J W Pew 310 Pine st
Bed Rock M Co	Arizona	1	05	Feb 6	Mar 13	Apr 3	C H Graves 6 Post st
Blue Bell Con M Co	Nevada	2	50	Jan 19	Feb 24	Mar 17	H P Bush 431 California st
Butte Creek Hydraulic M Co	California	8	10	Dec 29	Feb 15	Mar 16	A L Taylor 230 Montgomery st
Cahorca M Co	Mexico	5	30	Feb 25	Mar 29	Apr 17	W L Elliott 220 Sansome st
Compromise M Co	—	—	20	Feb 27	Apr 11	May 9	Wm Willis 309 Montgomery st
Golden Fleece Grav M Co	California	24	30 00	Jan 31	Mar 4	Mar 23	Fr Schirmier 785 Folsom st
Gopher Con M Co	Nevada	2	50	Jan 11	Feb 20	Mar 20	H Dess 309 Montgomery st
Little Chief M Co	California	1	5 00	Jan 13	Feb 17	Mar 11	S C Dean 22 California st
Metallic M Co	—	—	20	Feb 27	Apr 11	May 9	Wm Willis 309 Montgomery st
Metallic-Equator M Co	—	—	20	Feb 27	Apr 11	May 9	Wm Willis 309 Montgomery st
Pinal Copper Co	Arizona	3	2 50	Jan 28	Mar 6	Mar 27	Geo T Shaw 240 Fourth st
San Pedro G & S M Co	California	4	03	Feb 27	Apr 3	Apr 27	W G Holmes rm 1, Sherman's build'g
Sizourney G & S M Co	California	3	03	Jan 24	Feb 28	Mar 29	A Judson 320 Sansome st
Vanderhilt M & M Co	Nevada	3	05	Jan 16	Feb 24	Mar 16	J Morizio 328 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Chollar M Co	Nevada	W E Dean	309 Montgomery st	Annual	Mar 15
Ingersoll Con M Co	—	Calvert Meade	324 Pine st	Annual	Mar 15
Joe Davis G & S M Co	California	B F M Beeson	420 California st	Stockholders	Mar 14
Maryland Con M Co	—	E F Farnsworth	219 Sansome st	Annual	Apr 6
North Sierra Nevada S M Co	Nevada	C C Harvey	309 California st	Annual	Mar 14

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Mar 13
Contention M Co	—	D C Bates	309 Montgomery st	25	Feb 28
Northern Belle M & M Co	—	Cal Wm Willis	309 Montgomery st	50	Mar 15
Silver King M Co	Arizona	J Nash	315 California st	25	Mar 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Mar 13
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10	Jan 3
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10 (extra)	Jan 3

The Mining Share Market.

There is not very much to say about the mining share market one way or the other, for just at present it is attracting very little attention. The committee appointed by the San Francisco Stock and Exchange Board to consider the practicability of the members of the Board engaging in the business of buying and selling grain on commission, submitted its report at a meeting of the Board on Wednesday. The report recommends the organization of a new association, to be known as the "San Francisco Grain Exchange." This organization is to have a membership of 150, and its purposes are to be "to provide and maintain suitable rooms for a Grain Exchange in the city of San Francisco, to adjust controversies between members, to establish just and equitable principles, uniform usages, rules and regulations, and standards for classifications, which shall govern all transactions connected with the grain trade, to acquire, preserve and disseminate information connected therewith, to decrease the risks incident thereto, and generally to promote the interests of trade, and increase the facilities and the amount of the grain business in the city of San Francisco." The organization will have its own caller, and he entirely distinct from the San Francisco Stock and Exchange Board.

The following shows the financial condition of leading mines on the 1st inst: The following mining companies had each on hand March 1st in the sums stated: Alpha, $1.974 72; Best & Belcher, $4,699.17; Chollar, $17,561.27; Challenge, $320.39; Exchequer, $12,884.04; Gould & Curry, $19,368.80; Hale & Norcross, $2,164.16; Imperial, $7,485.29; Julia Con., $1,066.34; Justice, $15,593.96; Occidental, $6,604; Potosi, $3 487; Sierra Nevada, $5,973.35; Savage, $957.21; Silver Hill, $1,330; Utah, $3,457.64. The following mining companies had an indebtedness March 1st: Belcher, $39,000; Bullion, $20,431; California, $3 549; Crown Point, $544 50; Mexican, $22,713.53; Ophir, $22,079.54.

Of the flooded mines on the Comstock, the *Enterprise* of the 8th, says:

The water day before yesterday did not reach a point ninety feet above the 2,300 level, as reported yesterday morning. It would have been at the point mentioned day before yesterday, at four o'clock in the evening, had it continued to rise as rapidly as it was rising in the morning, hut it apparently reached some level in which there were many large openings. Yesterday morning it was within eighteen inches of the highest point reached on the occassion of the former big flood, and last evening it was eighty-three feet above the 2 300, or seventeen feet above the 2,200, and rising slowly. During the past twenty-four hours it has risen hut five feet. It is supposed that the water may now be filling ground in the Overman, probably on the 1,900 level, which, owing to the difference in the levels of the two mines, it is thought it may have reached.

Where the water will stop it would be hard to even guess. To reach the Sutro tunnel it must come up to within 1,513 feet of the surface. The pump is still kept running at five strokes per minute. Seven stroks per minute are fonnd to hold it, which is some gauge of its strength. As yet no arrangement has been made for a combined effort toward pumping it out. The Belcher is the only pump besides the Yellow Jacket, that can he brought to hear on it. In addition, the Yellow Jacket company could run their hoisting tanks.

Meetings and Elections.

Golden Chariot, March 6th. Trustees—John Rosenfeld, L. Gerstle, J. Clark, R. T. Carroll, Henry W. Seales, Archibald Borland and Louis Rosener. The act of the President in leasing the mine to Richard Bennett, Oct. 31, 1881, for a period of six months, was ratified and approved, and the Secretary authorized to notify the lessee that the Co. would resume possession of their property at the expiration of the lease. The Secretary's report shows that the receipts from bullion during the past five months were $25,408 25, and the expenses $19,267.67, leaving a balance now on hand in bank of $6 340.58.

Lucky Hill Con, March 6th. Directors—E. J. Baldwin (President), W. A. Lampe (Vice-President), F. A. Henke, M. J. Newmark and W. A. Green. H. A. Unrich, Secretary.

Father de Smet. At the recent annual meetiug the receipts for the past year were shown to have been over half a million dollars, and the expenses $314,666. Dividends of $25 000 each were paid in March, April, May, June, July, Novemoer and December. On the 1st of January, 1882, there was a balance on hand of $42,824, and the clean-up for the first half of January was $18,437. Dividends were paid on the 1st of January and 1st of February 1882.

Sutro Tunnel Co., March 6th. Directors—C. W. Brush, David Cahn, F. F. Son, Wm. Irvine, William Johns, Hugh Marshall and John Meyer. The following officers were appointed for the ensuing year: C. W. Brush, President; William Irvine, Vice-President; Pelham W. Ames, Secretary; Lazard Freres, Treasurer; and Thomas, Superintendent.

Potosi M. Co., March 7th. Directors—A. K. P. Harmon, C. L. Weller, William Norris, J. H. Dobinson, J. D. Fry President. A. K. P. Harmon; Vice-President, C. L. Weller, Secretary, W. E. Dean, Superintendent, I. L. Requa.

Hale & Norcross M. Co., March 7th. Directors—Chas. T. Bridge, George Congdon, S. Heydenfeldt, W. S. Hobart, W. Kohl, E. Norton, Walter F. Sell. President, George Congdon; Vice-President, Walter E. Sell; Superintendent, D. B. Lyman; Counsel, S. Heydenfeldt; Treasurer, Nevada Bank; Secretary, Joel F. Lightner.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

CALIFORNIA PIANO MANUFACTURING CO.—March 6th. Capital, $200,000 Object: To manufacture, sell, rent and hire pianos and other mus cal instruments, yesterday filed articles of incorporation with the County Clerk. Directors—Eugene Soule, Henry F. Marsh, John W. Stewart, F. W. Von Reynegom, John Henderson, Jr.

LESTER M. CO.—March 6th. Location: Arizona. Capital, $2,000,000. Directors—Alexander Herman, Claude L. Smith, Simon Silverberg, H. W. Tucell, Sam Hart.

A SIXTEEN-MULE team pulled out from Winnemucca for Silver City, I. T., recently, which, together with the freight wagons attached, covered 150 ft. in a straight line. The train was laden with 125,000 lbs. of merchandise.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

ISABELLE.—Monitor *Argus*, March 6: The Isabelle Gold and Silver M. Co. is kept constantly running on ore from the Stella mine. It is reported that the ore is much richer and not so base as heretofore in the mine. The mill has been on ore the last few days that assays from $300 to $400 per ton. We are confident the Stella is a rich mine and we sincerely believe Mr. Chalmers has a boranza. The wood business in Alpine the present season is one of its leading industries. Seven wood camps are in full blast, and about 10,000 cords of wood are being cut for the spring drive to be run down the Carson river this spring.

AMADOR.

GOVER.—Amador *Dispatch*, March 4: The Govsr mine, which has been closed down for a year or more, started up on Monday last, and they are now hoisting the water out of the shaft. The Hazard, Potosi, Seston and Maryland mines are still working. The Potosi mill was started up this (Thursday) morning. The Phœnix reduction works also started up to-day.

SOUTH SPRING HILL.—Amador *Ledger*, March 4: J. R. Treglon has been in San Francisco for two weeks past in the interest of this company. In all probability the mine will be started up soon

SEATON.—The first clean-up was made this week, but as yet we have not heard the result. There is rock enough to keep the 20-stamp mill running steadily Sulphurets from this rock are unusually rich. They yield about $180 per ton; but a month's run will not produce more than between 5 and 6 tons. It is intended to sink a new shaft immediately. D. T. Davis has resigned the superintendency, and at his suggestion Mr. Simons, from Tuolumne, has taken charge.

FROM VOLCANO.—The quantity of rain which fell during the latter part of last week and first of this, with strong indications of more to come, has encouraged our miners to some extent in the belief that there will be a good though short season for them yet. At the tunnel things are booming. The water supply is not sufficient to enable them to work continuously, but is a great deal better than it has been any time during this winter. Their great reservoir fills up about 19 times in 24 hours which, with the assistance of the hydraulic, makes the ground disappear quite rapidly. Another giant is being put up, to be supplied with water from the Jackson ditch, which is in thorough repair as far as Tiger Creek. At the Downs mine a clearing is being made around the new shaft, preparatory to putting up the hoisting works. Water is the propelling power at the Golden Gate mill now, notwithstanding only enough can be obtained to run 5 stamps. The Grass Valley claim is in full blast, with all the water they know what to do with, and plenty of rich ground upon which to use it.

CALAVERAS.

SOUTHERN MINES.—*Mountain Echo*, March 1: Work is progressing finely in the Black Oak mine, and big results may be expected soon. Bill West & Co, are working their mine near the Great Western. The lead is small but prospects well Lindsay & Co., are working steadily in their mine drifting for the main lead, with every prospect of a good strike when they get to it. Work on the Bald Hill mines is still going on, under very unfavorable circumstances, however, owing to the bitter cold and disagreeable weather. Findley & Co. have just started two arastras. They have on hand about 30 tons of ore taken from the Doc. Hill mine, and which has the appearance of being rich. The lead is about 6 ft wide at a depth of less than 20 ft.

MONO.

MACHINERY FOR THE GREAT SIERRA.—Bodie *Free Press*, March 2: The work of hauling the new machinery for the Great Sierra mine up the mountain is now in progress. It is expected that it will take from 15 to 20 days to get this machinery to the mouth of the tunnel. There are several pieces, the heaviest of which weighs at least 2,200 lbs. Owing to the grade, this machinery must be taken up by the aid of a block and tackle, thus making the progress very slow. One bench is 1,250 ft high and another one about 700 ft. The angle is 45° and the entire distance is 6½ miles. Fifteen men will be employed in the work. No small expense will be entailed in forwarding this enterprise, and it is to be hoped those who are expending the money will be duly rewarded.

BODIE ITEMS.—*Free Press*, March 7: The Bodie, just now, is a mine that people are closely watching, and many inquiries are made regarding the rich vein of ore in the west crosscut under winze No. 6. When this vein was cut, a short time ago, it was about 0 inches wide. Now it has widened out to 12 inches, and the ore is of a very rich character. But 2 or 3 tons are being crushed each week, but the average assays run up to between $900 and $1,000 per ton. The chances are good for this streak of ore widening out and developing into a bonanza similar to the one struck in the Bodie in 1878. The formation of the ground and the location are certainly favorable. A strike just at this time would stimulate mining and set the whole chain of mines in motion again. Business would increase, dozens of men be put at work, and the town would boom as in the early days. But we must be patient and let pick and blast uncover what must be hidden beneath the surface. The Standard Con. is prospecting energetically, and the 1000 level is looking much better now than formerly. The hullion shipments come up to the average, and the regular dividend (No. 39) has been declared and payable on the 13th. The Noondays are producing enough ore to keep the large mill running, and, in the meantime, prospecting is active. The Oro Co. is crosscutting on the 714 level. As warm weather approaches the outside camps are beginning to regain activity. In Lundy there is talk of erecting a mills during the coming summer, and Aurora is happy in possessing a 20-stamp mill, which will be kept running for a year at least. Aurora has mines, but no money; good prospects, but not enough energy. A great many Bodie people are interested in Sweetwater, and the outlook for that young district is of the most encouraging kind. Considerable money and a great deal of labor will go into the district this summer. Altogether, Mono county is looking up, and the favorable indications are steadily improving.

NEVADA.

SCOTIA MINE.—Nevada *Transcript*, Feb. 5: The New York *Mining Record* asks of the *Transcript* what is being done with the Scotia mine at Grass Valley and what are the chances for its stockholders. The Scotia is still idle. The shaft is filled to the top with water, the pumps and all underground appurtenances having been removed to the surface. After sinking a compartment shaft about 150 ft deep the water became uncontrollable and heavier machinery was procured. After this machinery had all been set and put in motion the mine ran a short time, when it closed down. From the 150 level and at various other points drifts were run but it is said none of the ore found assayed high enough to encourage the stockholders in expending any more money. The hoisting works and all the buildings still remain, the property being in charge of a watchman. Various rumors have been afloat about the mine starting up in the spring, although our reporter cannot obtain any definite information to warrant such rumors. The ledge it is said did not come up to the expectation of the prospectors, and that seems the long and short of the business. The management paid all its indebtedness before stopping work

COPPER MINES.—*Tidings* March 5: We learn from Capt. Bitford, who came up from Spenceville on Tuesday, that the copper mines in that section are now looking much better than recently heretofore. The gentleman informs us that the San Francisco copper mine is turning

out about 38 tons of pure copper per month. A dividend was recently declared.

MINING BUSINESS.—*Tidings*, March 6: There is a considerable talk in mining circles here about the starting up of the Massachusetts Hill mine in the spring, as negotiations are now being made to that end in San Francisco. Everybody who is acquainted with the Massachusetts Hill property have the utmost confidence in its richness. There is a bright outlook for lively times here this season, in a mining way.

STEAM STARTED.—Steam was started this afternoon on the Ontario mine, located on the lower Colfax road near the Blodget ranch. The mine has been bonded by Messrs. Richardson & McGriff, who propose to develop the ledge. Hoisting works are now complete on the property, and a perpendicular shaft will be put down immediately.

BARS OF BULLION.—*Herald*, March 7: The Citizens Bank yesterday forwarded to Thomas Price, assayer, San Francisco, two bars of gold bullion from the hydraulic claim of Duncan & Co. The bars are valued at $4,100, and are the result of a recent clean-up at the above claim, which is located at the Rogers ranch, on American hill.

OPERATIONS IN VARIOUS QUARTERS.—*Transcript*, March 7: Work having been abandoned through the new shaft on account of the heavy flow of water, the Derbec Co. are principally confining their operations to the old workings. The ear mules have been taken down into the bowels of the earth again, and the stable rebuilt for their accommodation. It will probably be months before these faithful creatures see sunlight again. The making of a drain tunnel is undoubtedly necessary to the prosperity of that claim. It contains large deposits of rich gravel, but the enormous expense of raising the water by steam power precludes the probability of anything better than Irish dividends.

PLUMAS.

GREEN MOUNTAIN.—Greenville *Bulletin*, March 2: During the weeks that the Green Mountain mills have been idle the machinery has been thoroughly overhauled and everything about the mills and mine put in the most complete working order. The mills will be started up by the end of the week. About 3,000 tons of milling ore are reported stored in the mills, mine dumps and chutes. Tunnel No. 5 is in about 3,000 ft, two-thirds of that distance being on the vein; it has now cut the third and main greatore chimney of the mine and opened it over 250 ft through pay, the face still in excellent ore. The upraise, 400 ft through ore in the sulphuret ledge has just made connection with tunnel No. 4 The work has been rapidly pushed during the past 5 months and now its completion places the mine in a better developed condition than at any former time in its history; the amount of ore added to the reserves of the mine is very large. The mine promises a handsome production for the future.

THE SOUTHERN EUREKA was the last mill that had to yield to the scarcity of water, but it had to hang up at last. The enforced idleness was but brief, however, for on Saturday the mill was started up again, and is now running as usual. The wise course of the superintendent in arranging to pump the water back after it had once passed the batteries and make it do duty over and over again enabled him to keep the mill running long after all others in the district had stopped. With the amount of ore in sight in this mine it is strange that the company do not increase their milling capacity.

GOLD STRIPE.—It is reported that the Gold Stripe mine is showing a good ledge of ore in its western part which is being rapidly opened. Considerable depth has been attained; the necessary connections with the tunnel will be made, and in the early spring work will be sufficiently advanced to commence milling. It is very much to be regretted that the excellent and extensive plant should be standing idle, and we hope to see it working to its full capacity before long.

KETTLE.—The Kettle mine has been thoroughly drained, the timbering of the main levels and stopes strengthened, and the ore in the face of the old levels will be sent to the mill as soon as the letter can be started up, which is expected to be done before the week ends. The amount of work accomplished by the present company is very large, and the developments made, as greater depth is attained, well sustains their hopes. Sufficient ore is now exposed in the mine to ensure steady runs for the mill for a considerable time.

ANOTHER PROSPECT.—Plumas *National*, March 4: Hallahan & Co., who have been running a prospect tunnel on the west side of Minnehaha creek, have found bedrock and report says got a fine prospect. Their tunnel was too high, and a shaft was sunk from it over 50 ft in depth. The work develops a fine bed of blue gravel and blue clay, and pan prospects show that the gold is there. This is something entirely new, and an important strike, as the channel is undoubtedly very extensive. They are putting in pipe to furbish good air and will soon show up what is in the claim.

NEVADA.

BATTLE MOUNTAIN DISTRICT.

REPORTED STRIKE.—Lander *Free Press*, March 3: It is reported that a big strike has been made in old Battle Mountain. John Kinney and Jake Schram are the lucky finders. We have seen specimens, but do not know the exact location. Hope the strike is as good as the specimens indicate.

CANDELARIA DISTRICT.

NORTHERN BELLE.—*True Fissure*, March 4: The character of the ground in the main shaft is very hard, and some time has been consumed in timbering, in consequence of which but 9 ft have been added, making the total depth of the same 84 ft to the 27th inst. The daily yield of ore has been about 54 tons. Both mills are running steadily. Mill No. 1 is still engaged half time on Mount Diablo ores. Bullion shipments for the week ending March 2d, $14,591.20. Total shipments on February account, $60,293.07.

MOUNT DIABLO.—The general appearance of the mine is much the same as at the date of last report. The stopes above the east drift on the third level continue to turn out the usual amount of ore, and the stope below the north crosscut from the west drift on the third level shows improvement. The stope below the north crosscut on the second level, near the center of the mine, continues to open very well, assays of the ore broken going from $124 to $434 per ton. The stope on the first level is looking very well. Bullion shipments on February 25th, $8,263.87; shipments on February 28th, $9,283.02; total shipments for February, $47,187.23.

EAST MOUNT DIABLO.—The main drift is progressing finely, and for the past week has been advanced 14 ft, making a total distance of 25 ft east of the company's line. The appearance of the ground is good, and everything points to a fine development at an early day.

GEN. JACKSON.—Work was resumed on Wednesday on this mine in the east incline shaft. Some first-class ore is being extracted, and the ore dump has already grown quite large.

PRINCESS.—Some active work is now being done in sinking the shaft. Three shifts are employed, and good progress is being made in ground that yields well.

CORNUCOPIA DISTRICT.

SALT.—*Silver State*, March 7: Three of Peter Rask's teams are being loaded with salt from the Desert Crystal Salt Works, for the new mill at Cornucopia. They expect to leave to-morrow, and they take about 70,000 lbs. of salt.

ELLSWORTH DISTRICT.

ORE SHIPPED.—Cor. Grantsville *Bonanza*, March 4: Since my last Frank McPherson has come to the front with a new mine discovery, and to call it a young bonanza would not be saying too much for it. It has been named after its owner, and is situated at or near Marble falls, in the Marble Falls canyon. The ledge or body of ore, as far as uncovered, will average 2 ft in width. Character of ore—horn silver, chloride and sulphurets. Mr. McPherson shipped to the Downeyville furnace last week between 2 and 3 tons of the ore, which averaged $231 per ton. The ore was not assorted, but shipped just as taken from the mine. Work in and about the Esta Bueda is progressing as usual.

EUREKA DISTRICT.

PAYMENT.—*Sentinel*, March 2: The Eureka Tunnel Co. yesterday made a payment of $9,723 to Messrs. Paul Fifield, W. J. Mulloy and M. H. Joseph, in part payment of the purchase of the El Dorado mining property. Messrs. Lyons & Keefe, owners of the Chief and Dugout mines on Prospect mountain, have extensive bodies of ore in each of the above named properties, a large portion of which will pay $200 and $300 per ton. They will commence shipping the ores to the furnaces as soon as the roads will permit.

LEWIS DISTRICT.

STARR GROVE.—*Herald*, March 1: The Clark incline is now down 300 ft and the station timbered; drift started south in 7 ft; good ore on the footwall; a level has also been started north from this station.

CHLORIDE.—Quite a stream of water flows from the face of the drift, and the ledge is looking much better than it did.

MORNING STAR.—Three shifts of men are kept going on the Morgan incline in the Morning Star mine, which will in a few days have attained a sufficient depth to connect by a level with the lower level from the Mayo incline, opening up a large block of stoping ground. Several tests have been made of the ore by milling process and good returns received. Capt. Dahlgren, managing director, has satisfied himself that he can mill the ore to a very high percentage. An assay office for this company will shortly be established in Lewis—probably in Middle Town.

EAGLE.—The contractors in the Eagle tunnel have made good headway during the past week. The flow of water is increasing as the tunnel is driven ahead. The ledge has not changed much in character.

HIGHLAND CHIEF.—The Lothwell incline in the Highland Chief mine is still being sunk and the drift south pushed ahead. Some good ore has been taken out during the week, and the indications are more encouraging.

EMMA.—The contractors on the Emma mine are still sinking the main shaft and running the tunnel.

BETTY O'NEAL.—The ore in the south lower level is still improving in quality in the Betty O'Neal, both in size and quality. The stopes are supplying the usual amount of ore, which is being piled up on the dumps, and shows for itself.

SUN BEAM.—Work on the Sun Beam is progressing and reports from the mine are flattering. The winze is still in good ore.

SPRING VALLEY DISTRICT.

PLACERS.—*Silver State*, March 7: The Chinese have resumed operations in the Spring Valley placer mines, south of Unionville. Those who left there during the very cold weather are returning, and it is not unusual to see a dozen or more of them at a time wending their way from the railroad to the mines, heavily loaded. The Chinese have taken hundreds of thousands of dollars out of those mines, every dollar of which has been shipped to China, save what they paid for pork and "blandy."

STAR DISTRICT.

HIGH GRADE.—*Silver State*, March 7: The De Soto mine at Star is said to be producing a large quantity of high grade ore. We are informed that 10 men are now at work in the mine and that the number will be increased shortly. The De Soto is the deepest shaft, and, according to all reports, one of the best mines in the county, though work was suspended on it several times before the present depth was attained. Carloads of ore shipped this winter yielded over $700 per ton in silver.

UNION DISTRICT.

ELECTION OF MINING RECORDER.—Grantsville *Bonanza*, March 4: At an election for Mining Recorder held in the town of Grantsville, County of Nye, and State of Nevada, in and for Union mining district, February 24th, 1882, the whole number of votes cast was 139. S. G. Post, having received a majority of the votes cast, was duly elected Mining Recorder of Union mining district, Nye county, Nevada, for the ensuing term.

WILLOW CREEK DISTRICT.

PLACER AND QUARTZ CLAIMS.—A note from Willow creek, on the Idaho road, to the *Silver State*, says: New placer mines have been discovered on the creek. J. F. Upson, the discoverer, has found a deposit of gravel 2 ft thick, which prospects from 5 to 25 cents to the pan, and no bedrock has yet been found. These gravel diggings are situated below the Emma mine, owned by A. H. Ruse & Sons. The Emma mine is improving as the work progresses. The tunnel is now in 130 ft, and every foot run seems to improve the appearance of the lead. There are now 50 tons of ore on the dump, which assays from $50 to several hundred dollars per ton in gold and silver. The Comstock, situated on Flat creek, and owned by Siskron & Co., is among the best mines in the district. It is prospected by a tunnel 150 ft, and there are 75 tons of ore on the dump which assays from $100 to $800 per ton. Now, all we want is mills to make our camp one among the first in the State.

ARIZONA.

GLOBE DISTRICT, *Chronicle*, March 4: A day or two since, we made a personal examination of the group of mines constituting the property of the Hoosier Mt. Co., situated about 1½ miles from Globe, in company with the obliging superintendent, Mr. W. E Spence. The first striking feature is seen in the fact that there is a mineral belt from 1,200 to 1,500 ft in width, in porphyry, syenite and limestone, lying on either side of a deep gulch, bounded on both sides by quartzite formations. We first visited a prospect shaft being worked on the Nevada, of which Mr. Spence is one-half owner, lying above and northeastward of the Hoosier. The shaft shows a well-defined ledge of copper ore, with a smooth hanging wall of syenite, the ore carrying copper glance and sulphurets, apparently very rich. This ledge can be traced for a long distance; is widening in the shaft and is undoubtedly a permanent ledge. About 900 ft below the first opening on this mine is a shaft 37 ft deep, at the bottom of which is a crosscut of 3 ft, all in solid ore, which gives an average assay of 30 per cent. copper. The width of the ledge here is not yet ascertained. On the Hoosier, more developed than either of the other mines, about 80 ft from and about 30 ft higher up than the main opening, a tunnel cuts the ledge crosswise 47 ft with 30 ft drifts, all in good ore. Below this, another tunnel runs in 32 ft, where an immense body of ore was struck and opened up to the surface, through ore all the way, except a thin capping of iron on top. This opening is over 15 ft across. From it, at right angles with the tunnel, a 75 ft tunnel is run, cutting off 4 ft of ledge matter, all good ore. Near the opening named, a winze, 110 ft deep, has been sunk, from the bottom of which a drift, in ore, runs 150 ft, where a large cave was struck, stopping work in that direction. There is on the dumps of the Hoosier, a thousand tons of pay ore, extracted during the past 6 months, and on the other mines above named about 300 tons; while there are immense bodies of rich ore in sight, estimated by a trustworthy practical miner not less than 7,000 tons in the Hoosier alone.

COLORADO.

THE GERTRUDE MINE.—Park Co. *Bulletin*, March 5: On several occasions we have been shown very rich ore from this mine. The richest we have yet seen was brought from the mine a few days since, by Mr. Bush, the superintendent. It is a very fine quality of quartz studded with free gold, and showing a large percentage of silver as well. It is taken from an 18-inch streak which was developed some weeks ago. The ore was then scattered through the rock for 3 ft. It is now condensed into a well-defined streak of 18 to 20 inches, and is very much richer. The company are working a force of 18 men, and are pushing development work only as fast as possible. They will build a 20-stamp mill early in the spring, ½ of a mile below the mine, to which they will deliver the ore by a tramway. There are between 1,500 and 2 000 tons of ore on the dumps which will mill at least $100 per ton.

CRITERION.—The ore in the Criterion is rapidly improving in quantity and quality in the tunnels, work upon which is being pushed rapidly. We are informed by a gentleman who recently visited the mine that he has visited the mines of 5 different counties in the past few months exploring mines, and he has seen nothing equal to it, all things considered, and that he looks upon it as one of the largest mines in the country.

GOLD STAR.—The Gold Star, near the Gertrude, is a very promising mine. A shaft 28 ft deep exposes a pay streak of 18 inches which carries very largely in gold, silver and copper. The various tests of the ore give a return of 30 ounces of silver, 25 per cent. copper and from 1 to 6 ounces gold. It is owned by Messrs. Traver & Co., of this place.

NOTES.—Caledonia mine on Bross, owned by the Messrs. Currie Gorman and Frazer, has recently developed some good ore. A tunnel 30 ft long, has been run on the vein 20 ft below the surface. The face of the tunnel is now in ore. A number of tons of ore taken from it milled 45 ounces silver and 35 per cent. lead. The vein is well-defined and strong, cropping for some distance on the surface. The mine joins the Dolly Varden on the east least in a desirable locality. With a 10-stamp mill going up, the Gertrude soon to build one and Blunk's mill to be put in operation, with a smelter in prospective, Montgomery will soon witness the active scenes enacted there years ago. The numerous recent rich developments at and near Montgomery are causing quite a stir in that locality. A great many prospectors are going there and locating all the vacant ground they can find.

ORE IN THE ROBINSON.—Georgetown *Courier*, March 2: The news that the Robinson mine is again in big pay will be received with pleasure throughout the entire State, and it may be the commencement of a new era to Eastern investors in Western mines. The history of Eastern companies, with but few exceptions, heretofore has been that the mines have been put on the market at too high a price and a thorough disgust for the business has been the result, and the consequence is that the stocks of many mines of merit, during the past year have been depreciated to much less than their real value. It has been a case of going from one extreme to the other. With this result the rule rather than the exception, as a matter of course nearly everybody who has touched mining stocks has suffered. But matters cannot always remain as they now are. The value of mines, like the value of wheat, will sooner or later find its true level, and when another reaction sets in the rule will be that the holders of stocks will make money instead of losing it, and if this strike in the Robinson proves to be as good as reported it may be the turning point in restoring confidence.

STRIKE AT EMPIRE.—Work was resumed a few weeks ago on the Empire City lode at Empire, by Husted, Suttle and Moore, and last week they were rewarded by opening up a vein of quartz and iron pyrite ore, 10 inches in thickness, in which are small scattered veins that carry native gold visible to the naked eye. The ore was struck in the lower adit, which has been driven at odd spells for several years, during which time it has been in cap-rock, and as the cap has now been penetrated the prospects of the mine becoming a steady producer are considered excellent.

STRIKE BY GRADERS.—Last week a promising looking lode was uncovered by the railroad graders at the Devil's Gate, carrying a vein of galena and decomposed ore from a half inch to an inch in thickness that assays all the way from 173 to 528 ounces of silver to the ton. A couple of sacks were tested this week and returned 151 ounces first-class and 74 ounces second class. The lode is evidently a large one, and the south wall is not exposed, its course being only a slight deviation from the course of the railroad grade at that place. It has been located by Messrs Vette, Burns, Ballard and Dickey, who have named it the Workman's lode.

IDAHO.

THE MINES.—Wood River *Miner*, March 1: The mines mentioned this week are situated in the Sawtooth mountain range, about 30 miles north of Ketchum, near Galena.

THE SENATE property is owned by E. P. Moore, James Wolworth and Col. E. Green. It is in Senate mountain, on which several good claims are located, and was one of the first mines discovered in the neighborhood of what is now called Galena. The ore crops out for nearly 1,500 ft and is said to be, uniformly, high grade. It is composed of sulphurets, carbonates and galena, and averages about 200 ounces in silver per ton. Last season considerable development was made, consisting of a tunnel which strikes the ledge at 100 ft from the point of entrance, and 5 shafts of various depths. All openings show ore. Over 300 tons have been taken out, assorted and partly sacked.

THE RED CLOUD.—The Red Cloud is near the summit of the main Sawtooth range, about the level of the sea. A tunnel was started in this mine a short time ago and is now in 30 ft showing good ore. An open cut has also been made, from which several tons of ore were extracted. A large amount of high grade ore is in sight and 100 tons are now piled on the dump. The Chief, which shows a very fine ledge, is 1,000 ft below, and runs parallel with the Red Cloud. Many tons of ore that will run above 100 ounces have been mined and are now upon the dump ready for sacking.

THE SENATE SMELTER.—Late last fall a water-jacket furnace with a daily capacity of 20 tons was put up at the foot of Senate mountain 1½ miles from the mine bearing the same name. Four fine buildings have just been completed for these properties consisting of the smelter building, a large boarding and lodging-house for the men, and a fine coal house in which are upwards of 10,000 bushels of charcoal ready for use in blowing in the furnace early in the spring. The fourth building is the saw mill. All the necessary fluxes, such as iron, lime, etc., are found in large deposits near at hand. The Moore Brothers, Dr. Agard and others own several good mines near the Senate group, among which are the Occident, Modoc, Last Chance No. 2, Comet and Meridian. The Last Chance No 2 has over 100 tons of ore on the dump and the others from a fourth to half the quantity. They are all easily accessible by means of wagon roads from Galena and the smelter. The owners expect to do some extensive development work as soon as mining revives with the approach of spring. There are 30 good prospects within a radius of 1½ miles of the Senate company's smelter notable among which are the President, Conway, Castle, Wellington, Leviathan and Mollie. They are all tributary to the smelter. There is ore enough in sight, within a few miles, to keep 6 furnaces of 20 tons capacity, busy winter and summer. Nearly all the mines and prospects on and near Senate mountain are to be worked, more or less during the coming season.

THE CHARLES DICKENS—FABULOUSLY RICH ORE BEING EXTRACTED.—Yankee Fork *Herald*, March 1: Last Monday we paid a visit to the famous Charles Dickens mine, where it had been reported another important "find" had been made during the past two or three weeks. After passing through 800 ft of the main tunnel, we entered the south crosscut, where a tunnel is running on the rich east vein. In the face of this tunnel, which is 900 ft in the hill and 300 ft below the surface, we found the vein to be nearly 2 ft in width, and in which we could plainly see gold and silver diffused through the ore. This vein all along the tunnel yields shipping ore that averages $2 300 per ton, the first-class average assays being $3,681.48, and the second-class $1,072.54. It will be seen by these figures that of the 45 or 50 tons of shipping ore being sacked more than half is first-class. Stoping has commenced, and by spring a large quantity of this rich ore in sight will be extracted and sacked ready for shipment. The ore in the lower ore house averages $152.63 per ton, while the upper ore house is nearly filled with richer ore than has ever been worked in the arastra. We would like to see a mill on this mine. The crushing of 20 or 25 tons of ore per day would astonish the world with the products. If the mine was in Nevada or Montana capitol would be glad to get it for $1,000,000. It is the best mine in America, and has all of the advantages of timber, mill sites, etc.

NEW MEXICO.

BULLION.—*New Southwest*: The Adams' Express Co. shipped this week, for the Mimbres M. Co., 4 silver bricks weighing 352 lbs, and valued at $5,068. Meredith & Allman received last night, and forwarded by Adams' Express, 2 silver bricks from the McGregor mine, weighing 158½ lbs, valued at $2,035. Miners are bringing a good deal of gold into Pinos Altos from the placer washings on Bear creek. The recent heavy rains have brought down an unusually heavy quantity of gold. The Bald Mountain district, 9 miles west of Silver City, is looking up. Claims have not been worked to any great extent, the deepest shaft being about 60 ft, but the ground has been carefully prospected, and the coming of spring will induce a general boom in its properties. The ores are gold and silver quartz, and assays from the top of a claim owned by Dickinson, Buck & Ross show 30 ounces in silver and $16 in gold. Other claims are equally as promising.

SHAKESPEARE.—The operations of the Shakespeare Co. M. Co. have infused new life into that camp, and mine owners, both there and at Leitendorff, are pushing work with vigor. We learn from W. J. Crosby that the furnace of the company, which was started up some three weeks since, ran for three days, reducing an average of 20 tons of ore, with a daily product of 15,000 lbs of lead bullion. The ore was from Shakespeare and Victorio, and the bullion is well up in silver. On the third day it was found that the crucible or bottom of the furnace was leaking, and work was stopped for repairs. Starting up again on the 6th inst., a two weeks' run was made on the same class of ore, the average daily output being about equal to that of the first run. It was then found necessary to shut down again, for the purpose of placing in position the new 30-ton copper furnace which had just arrived, and which is to be operated in conjunction with the silver smelter—the same power being used for both. This copper furnace was manufactured by Rankin, Brayton & Co., of San Francisco, under a patent designed by J. J. Hiertz, superintendent of the Shakespeare works. Both furnaces will be in full blast early next week. A roasting furnace and refinery are to be built immediately, and it is the intention of the company to make its works as complete as any in the country. It is the intention to buy ores on the same terms as those given at Pueblo and other points where reduction is extensively carried on. Shakespeare now has a population of about 200, there being about 75 miners at that place and Leitendorff, some 7 miles distant. A number of fine buildings are going up.

LAKE VALLEY MINES.—The work on the 20-stamp mill of the 4 companies is going forward as rapidly as possible. They have from 80 to 100 men employed on the mill work and in the mines. The machinery for the mill is partly on the ground, a portion is at Nutt station awaiting transport and the remainder is on the railroad between Deming and San Francisco. The constructor is Mr. Towne, and the mill will work 20 stamps, with a capacity to crush 60 tons of ore daily.

GROWING.—Bernalillo *News*, March 2: The steady influx of miners to the Sandias is showing itself in the corresponding increase of business in Bernalillo. New buildings are going up as if by magic, and now lines of business are being embarked in. Everything shows there is something behind our town that will shortly bring her out as a formidable rival to the self-styled "leading" towns.

MEXICO.

MACHINERY FOR SONORA.—Arizona *Citizen*, March 1: Within the past few days 2 shipments of mining machinery have been made to Sonora. The freight teams of Mr. Yjinto Aguerro were loaded and expected to leave this afternoon for Juarez with the hoisting and pumping machinery of the Caborca Mining Co., who at a depth of about 300 ft have encountered sufficient water to make the machinery in question needful. But with the incoming of the water a vein of ore has been opened, said to be about 4 ft in width and averaging from $35 to $100 per ton, of free gold bearing quartz. The company have employed about 100 men and in view of their new and improved discovery the company are pushing forward their developments, and although their 20-stamp mill is kept constantly at work, more ore is said to be on the dump than the present crushing capacity can handle. It had been a general fear among the miners of that section that the ore bodies so rich on top would not hold their own deeper down, but the strike in the Rosalia has given new life and encouragement to the many different enterprises that are on foot in that direction. The water level not only proves the mines richer than was at first anticipated, but the water itself makes good a long needed want. The mill of the Caborca Co. is about ¾ of a mile from the mine, and it is the intention of the company to pipe the water that distance for mill use, which will necessitate another trip for Mr. Aguerre to these parts, which until the present time he had not visited for the past 11 years. He says that for a long time they have lived on hope deferred but the bustling enterprise of the present time indicates that they are now soon to be realized, as the many mining companies now at work, or making preparations for work will develop the country and make it generally prosperous.

MONTANA.

DEVELOPMENTS IN LEADING MINES.—*Inter-Mountain*, Feb. 25: The Original Butte has 8 ft of high grade ore on the 200 level. The Bell is producing 40 tons of ore per diem, and the smelter is in smooth and successful operation. Operations will soon be resumed on the Acquisition. A crosscut on the 200 ft west drift of the Cora exposed 8 ft of 56 ounce ore, assaying 8 per cent. copper. The development of the Magna Charta goes bravely on with encouraging results, and the same may be said of the Alice. The battery samples in the Alice mills vary from $45 to $48, which is good enough. The Moulton is constantly improving with development, and in the 200 and 300 levels looks particularly well. The mill is doing good work, the percentage of chlorination being very high. The Belle of Butte is producing 25 tons of good ore every 24 hours. No stopes have yet been started. The owners of the Golden Rule are realizing a handsome stake from the development of that property. Louis Stettheimer has a very promising ore body in the Salvador. The Stevens is looking better than ever, and the stopes are in good shape. Joseph Ramsdell continues to ship 25 tons of ore per diem to the Montana smelter. The 120-ft west drift of the Clear Grit exposes 2 ft of $150 ore. It is now regarded as a very valuable property.

OREGON.

SUCCESS.—Jacksonville *Times*, March 2: W. Q. Brown is now engaged in thoroughly prospecting some mines in the vicinity of Canyonville for a company of California capitalists. He is meeting with flattering success and we may expect to see some extensive mining operations commenced in that district before long, for Will is full of enterprise and pluck.....Theo. Cameron, of Uniontown, informs us that all the miners in that vicinity for miles around have an abundance of water and expect to make a profitable run. The same may be said of every camp in Jackson and Josephine counties. The golden harvest will be bountiful if there is plenty of rain during the next few months.....The miners have plenty of water at last, and are happy.....The miners of Galice creek are all at work and a big yield is expected from that camp this season.....The Squaw Lake Co.'s ditches are being cleaned and repaired. Piping will be commenced soon.....Piping is now progressing in earnest at the Foreman diggings near Phoenix, which are owned by E. K. Anderson.....Gin Lin has about 20 Celestials employed in digging a ditch from Palmer creek to the red hills, several miles distant.....Miners are running on full time in Willow Springs district and increasing their forces. Extra hands are therefore in demand there.....John Marshall, of Coyote creek, has worked off a large area of ground with excellent prospects, as also have Hannum Bros. on upper Grave creek.....D. W. Anderson, Jas. Priddy and others, are now engaged in mining on Farmer's flat, with excellent prospects. They cleaned up about $150 the other day after having worked but a few hours.....Twenty-five hands are now at work on the Pacific mining company's ditch in the Wolf creek district. H. Morse and Mr. Brown, formerly of the St. Charles Hotel, at Portland, are superintending operations.....A nickel deposit is said to have been discovered in the vicinity of "Old Piney," a high and rugged mountain just north of Canyonville. A company has been organized to work it, and operations will soon be under way.

Expenditures on Mining Claims.

An Important Supreme Court Decision.

The following is the full text of a decision filed Feb. 25th, in the case of Du Prat vs. James et al., in Department Two of the Supreme Court of California. It covers several very important points to prospectors, locators, and mine owners:

This is an action to recover possession of a quartz mine. Judgment was rendered for defendants, and plaintiff appealed.

The objections to the answer cannot he eustained. The appeal is from the judgment, and the judgment roll only is inserted in the transcript. The plaintiff did not demnr to the snswer nor doss it appear that he objected to the evidence when offered to prove its allegations. The cause appears to have heen tried as if the answer was proper aud sufficient in all respects. Such objections as those of plaintiff, will not he permitted to he raised for the first time in this Court. (Racouillat vs. Rene, 32 Cal., 450; Cave vs. Crafts, 53 Id., 135.)

The cases of Atherton vs. Fowler, 6 Otto, 513, and Fletcher vs. Mower, 6 Pac. L. J., 521, cited hy plaintiff's counsel, have no application to this case.

It is contended that plaintiff was lawfully in possession when defendants made their location of the mine in question, and that defendants had no right to locate when their locations were made. It appears from the findings of fact, that the parties under whom plaintiff claims, properly located the mining claim or claims in question prior to tho 10th day of May, 1872, that the defendants entered upon and located the claims or mine partly on the first day of January, 1881, and partly on the fifth day of January, 1881, and that they filed for record with the proper Mining Recorder, the notices of these locations, as required hy the rules and regulations of miners, within 30 days from the date of such notices. It further appears from the findings, that the defendants made such locations on the ground thst plaintiff had failed to perform the lahor required hy the Act of Congress of May 10, 1872, and the acts amendatory thereof.

By the fifth section of the Act of Congress of May 10, 1872, it was provided as follows:

"On each clsim located after the passage of this Act, and until a patent shall have issued therefor, not less than $100 worth of lahor shall he performed or improvements made during each year. On all claims located prior to the passage of this Act, $10 worth of labor shall be performed or improvements made *each year* for each 100 ft. in length along the vein until a patent shall have heen issued therefor; hut when such claims are held iu oommon, such expenditure may he made upon any one claim; and upon a failure to comply with these conditions, the claim or mine upon which said failure occurred, shall he open to re-location in the same manner as if no location of the same had ever been made." (17 U. S. Stats. at Large, 92).

On the first day of March, 1873, Congress passed an Act hy which the provisions of the 5th section of the Act of May 10, 1872, which requires expenditures of lahor and improvements on claims located prior to the passage of said Act, were so amended "that the time *for the first annual expenditure*" on such claims was "extended to the tenth day of June, 1874." (17 U. S. Stats. at Large, 483; Sec. 2,324, U. S. Rsv. Stats.)

By Section 2,324 of the Revised Statutes of the United States it was thus provided:

"On all claims located prior to the tenth day of May, 1872, $10 worth of lahor shall he performed or improvements made by the 10th day of June, 1874, and each year *thereafter*, for each 100 ft. in length along the vein until a patent has heen issued therefor; hut where such claims are held in common, snch expenditure may he made upon any one claim; and upon a failure to comply with these conditions, the claim or mine upon whioh such failure occurred shall he open to re-location in the ssme manner as if no locstion of the same had ever heen made; *provided*, that the original locators, their heirs, assigns, or legal representatives, have not resumed work upon the clsim after failure and before such location."

It will he observed that hy this section it was provided that the labor to be performed or improvements to he made on olaims located prior to the 10th day of May, 1872, were to he performed or made hy the 10th day of June, 1874, *and each year thereafter*, until a patent had heen issued for such claim. The words "*and each year thereafter*," were here first added to the date mentioned, viz: 10th day of June, 1874.

The Revised Statutes of the United States were approved hy Act of Congress, passed on the 22d of June, 1874. Section 5,595 of this revision, consisting of 73 titles, declares that these titles embrace the Statutes of the United States, general and permaaent in their nature, in force on the 1st day of December, 1873. The acts above referred to, passed prior to the date last named, were repealed hy force of section 5,596 of the revision, hut all rights accruing or accrued under the Acts repealed were preserved by the provisions of section 5,597.

Congress further amended this 5th section of the Act of 1872, hy an Act passed on the 6th day of June, 1874. By this amendment, the time for such "*first annual expenditure*," on claims located prior to the Act of 1872, was extended "to the 1st day of January, 1875." (18 U. S. Stats. at Large, Part 3-61.)

The foregoiug Act of the 6th of June, 1874, is not affected hy the Revised Statutes, hut has as full effect as if passed after the enactment of the revision, *i. e.*, aftsr the 22d of June, 1874, and so far as it varies from or conflicts with any provision contained in the revision, hss effect es a suhsequent statute, and repeals any portion of the revision inconsistent with such statute. This results from the provisions of section 5,601 of the revision.

By the Act of the 22d of January, 1880, Congress amsnded section 2,324 of the Revised Statutes, hy adding thereto the following words: "Provided, that the period within which the work required to he done annually on all unpatented mineral claims shall commence on the first day of January succeeding the date of the location of such claim, and this section shall apply to all claims located since the 10th day of May, A. D. 1872." (See 21st U. S. Stats. at Large, 61.)

The counsel for appellant puts forth a contention in relation to the Act of June 6, 1874, in these words:

"The act of June 6, 1874, only amended the act of May 10, 1872, in extending the time for doing the annual work, which the existing laws required to he done hy June 10, 1874, to Jan. 1, 1875, hut did not make any arhitrary rule affecting the date of locations msde prior to May 10, 1872, so that that act became *functus officio* on the expiration of the 1st of Jan., 1875."

If hy this it is intended to say that the act of June 6, 1874, had its full effect on the 1st day of Jan., 1875, and that no provision of law then existed in regard to the work of improvements on a mining claim requiring that they should he performed or made in each year succeeding Jan. 1, 1875, we think the learned counsel has fallen into an error, as an examination of the various acts ahove referred to will show. What is said herein on this point, relatee only to claims located prior to the 10th of May, 1872, such being the character of the claims involved in this case.

By the act of May 10, 1872 (see Sec. 5), the lahor or improvements required as to such claim were to he performed or made "*each year*." The first amendment to this act was made on the 1st of March, 1873, and by it the time for "the first annual expenditure" was extended to the 10th day of June, 1874. The legislation on this matter next succeeding, according to the provisions of Sec. 5,601 of the revised statutes was Sec. 2,324 of the revision (see quotstion from it ahove), which required the lahor or improvements to he performed or made hy the 10th of June, 1874, "*and each year thereafter*." Then came, not in order of time, but as it went into operation, the act of June 6, 1874, hy which the time for the "*first annual expenditure*" for lahor or improvemsnts, was extended to the 1st of Jan., 1875.

But, as we have seen, this act has effect so far as it varies from or conflicts with any provision contained in section 2,324 of the revision as a suhsequent statute, and repeals any portion of the revision inconsistent with it.

The only inconsistency or conflict with the revision, Sec. 2,324, is as to the date to which the first annual expenditnre is extended, which, by Sec. 2,324, is to the 10th day of June, 1874, and hy the act of June 6, 1874, to the 1st day of January, 1875. There is no conflict or inconsistency so far as regards the words "*and each year thereafter*" in the Sec. 2,324, and they remain. The requirement, then, as enacted hy the legislation of Congress, was, after the 22d of June, 1874, that the first annual expenditure must he made hy the first day of January, 1875, and each year thereafter. (See Weeks on Mineral Lands, Sec. 69.) This, in our view, is the correct interpretation of the acts of Congress relating to the point under discussion.

If the act of the 22d of January, 1880, applies to the case in hand, of which we entertain some donht, the meaning is the same.

The learned counsel for appellant seems to lahor under the impression that the section 2,324 took effect suhsequently to the act of June 6, 1874; hut this is a misconception, as will he seen hy examining section 5,601 of the revised statutes, ahove referred to.

Upon a failure to comply with the conditions mentioned in section 2,324, among which are those which relate to lahor and improvements ahove stated, hy the provisions of the eame section, the claim or mine is "open to re-location in the same manner as if no location of the same had ever heen made."

The Court found that plaintiff failed to perform the lahor or make the improvements thereon as required hy law during the year 1880, commencing on the first day of January, 1880, and ending on the 31st of Decemher of the same year; that it wae open to re-location on the 1st and 5th days of January, 1881, on which days defendants made their locations.

It is argued hy oounsel for appellant, that the location on the 1st of January, 1881, was premature; that he had all that day to perform the labor or make the improvements required hy law.

The question is not free from difficulty. The act of 6th of June, 1874, extends the time *to* the 1st day of January, 1875. In Bradley vs. Rice, 13 Maine, 201, in the construction of a conveyance of land, which described a tract of land as running "*to Flying Pond*," the question was whether the tract ran into the pond or was hounded hy the water of the pond; the Court said: "To, from and hy are terms of exclusion, unless hy neceesary implication, they are manifestly used in a different sense." The tract of land was held to extend to the pond, sxolnding any portion of it.

In considering a question of the same character arising upon a deed in Bonney vs. Morrill, 52 Maine, 253, the same Court said: "From" an object or "to" an object "excludes the terminus referred to." The call on which the construction was made described a course as easterly "to land now or formerly owned hy Isaac Bonney," etc. The land of Bonney was held to he excluded.

If the question under consideration is to be determined upon the words of the act of the 6th of June, 1874, the 1st day of January, 1881, mnst he excluded from the time within which the plaintiff had to perform the lahor or make the improvements required for the year 1880. But it may be contended that the effeot of section 5,601 of the Revised Statntes is merely to substitute the 1st day of January, 1875, for the 10th day of June, 1874, in section 2,324, and that the section ought to he read, making snch suhstitution, thus: "Lsbor shall he performed, or improvements made *by* the 1st day of January, 1875."

If "hy" is a word of exclusion, as held in the above-cited case from 13 Maine, then the same conclusion must he reached as above, as to the 1st day of January, 1881, viz.: that it must he excluded from the period during which the lahor had to he performed, or the improvements made, for the year 1880.

In Rankin vs. Woodworth, 3 Penross and Watts, 46, it was held that a contract to complete work *by* a certain time, means that it shall be done hefore that time. The contract was dated in February, 1815, and was "to huild a sawmill" and "to have it completed hy Novemhsr next." The Court thus expressed itself in regard to it: "By the contract the work was to hs finished *by* the ensuing month of Novemhsr, which in the popular acceptstion of the word excludes the month. When a thing is ordered hy a particular day, it is with a view of having the use of it on that day. Thus a coat is ordered hy Sunday, with a view of wearing it to chnrch. And the popular agrees with the philological import of the word, which is explained hy our great lexicographer, by the words 'near, heside, passing, in presence;' all of which denote exclusion."

The proper interpretation of the legislation of Congress on the subject is, in our judgment, that *by* is used as a word of exclusion, and therefore that the plaintiff was not entitled to perform the lahor or make the improvements for the year 1880, on the first day of Jannary, 1881. A review of the acts of Congrese in regard to this point, leads us to the conclusion that it was the intention of Congress to confine the period, after the first day of Jan., 1875, in which the labor or improvements were to be performed or made by the clsimant of a mining claim, to the calendar year, commencing on and including the 1st day of Jan. of the year, and ending with and including the last day—the 31st of Decemher. This seems to he the construction put on this legislation by the officers of the Department of the Interior. (Sse Sickel's Mining Laws and Decisions, 373, 392, 393, 394.)

The Court finds that the plaintiff performed the requisite amount of lahor on the mine during the years preceding 1880. The finding as to the year 1880 is, that plaintiff "cansed three days *work* to he performed in and upon said claim," hut does not find the valne of the *work* performed. We cannot see that the work did not amount to $150 in value. It is not found whether this *work* consisted of lahor performed or improvements made on the claim. *Non constat*, hut it may have heen improvements made on the claim worth $150. This Court cannot know judicially whether this work consisted of lahor or improvements, or what the worth of it was. For the failure to find as to this worth or value which was in issne, the jndgment mnst hs reversed and the canse remanded that the worth or value of the work may be fonnd hy the Conrt below. In this course, we pursne the practice adopted in Billings vs. Everett, 52, Cal., 661.

Judgment reversed and canse remanded to the Conrt helow, with sn order to the Court to find on the said issue on the evidence taken or on such other evidence as may he adduced as to said issne, and thereupon to proceed to render judgment in accordance with the views expressed in this opinion. So ordered.

The North End.

The *Enterprise* says: Matters are looking quite hright at the north end at present. There was last evening but a small partition of solid ground hetween the drift going north on the 2700 level from the joint Mexican-Union winze and that south from the Union-Sierra Nevada winze. A set of holes was heing put in last evening which it was calculated would knock a hole through on heing fired. As soon as a track ie laid through the drift, work will he resumed in the ore recently found in the Mexican—not waiting to dig a drain, as that can be done at leisure.

The winze started on the 2500 level of the Union, to the eastward of the ore hody, was yesterday down 18 ft. and was already in good milling ore. As it was not expected that ore would he reached until the winzs had attained a depth of 25 or 30 ft., it would seem that the deposit is widening with depth. The ore is found to he richer than on the 2500 level. It is good milling ore, and ie being saved for redncton. A train of ore cars was sent out to the works yesterday, which looks somewhat like business. The ore taken out will at once be sent to mills for reduction.

There is much interesting ground that can now soon be opened in this section of the lode, and the chances are that some good developments will he made. The water in the winze down from the 2500 to the 2600 levsl is now, for some cause, receding at the rate of 2 ft. per day. This is what is known as the "wet winze." It will he remembered that some nine drill holes were run in various directions from its bottom, some of which penetrated ground yielding good assays. At the rate at which the water is now draining out of this winze, they will soon he able to drift from its bottom and prospect the surrounding country.

The Flooded Mines.

The Water in the South End Mines—Its Probable Source.

Three theories have heen advanced regarding the water lately struck in the Exchequer mine, which has flooded in so short a time all the mines south of the Bullion, except the Alta. Their discussion being a matter of great importance to the future of the south end mines, an *Enterprise* reporter has gathered the following facts from the leading mining men here:

The first theory advanced was that the water pumped hy the Bullion folks into the Julia had found its way into the Exchequer mine and had flooded the south end. The fallacy of this hypothesis can he easily demonstrated. The Exchequer drift on the 2800 level is 600 ft. east of the Bullion shaft, and its face 400 ft. south. Ahout eighteen months ago, hefore the Yellow Jacket pump hroke down, the Exchequer folks ran a diamond drill hole west 60 ft., and struck 20 miners' inches of water. At that time the Bullion mine was heing worked on the 2450 level, and its water did not diminish on account of water having heen struck in the Exchequer, nor did the water increase after the Yellow Jacket pumps hroke down, and the water in the mines to the south rose 200 ft. above the lower Bullion level. When the Bullion mine closed down the water rose to the 1950 level in the new shaft, and remained at this level, when the Jacket was drained to the 3000 level. When the Bullion mine started to pump its water in the Julia 1800 level, no excess was felt in the Jacket water. Therefore, no connection could exist hstween the water of these mines. Furthermore, since the Bullion started to pump its water in the Julia 1800 level ahout six inches daily have been pumped from the Bullion, or 180 miners' inches per month, which, during the four months the mine has heen running, makes a total of 730 miners' inches. After the watsr was struck in the Exchequer, for the first five days the Jacket pumped up and hailed a total of 510 inches. From the 17th to the 23d of the month, inclusive, the Jacket pumped 70 miners' inches daily, making a total for six days of 420 miners' inches. Therefore, since the water was struck on the 12th of the month, the Jacket mine has pumped and hailed a grand total of 930 miners' inches, being 200 minere' inches in excess of the total water pumped hy the Bullion company from the day they started up to the present time. So that, had the Exchequer mine drained all the water pumped hy the Bullion company into the Julia, the Jacket mine sbould bs dry to-day to the 3000 level, instead of the water having gained at the ratio of 100 miners' inches per 24 hours on the pumps. Many persons will still claim that this water goes somewhere snd will find an ontlet somewhere. If they will, however, remember the great absorhing power of rocks, clays and dscomposed quartz, and if they will figure the area for absorption and the amount to he ahsorbed, they may find the solution of a problem which they cannot to-day understand.

The second theory is that the water comes from the west wall. Surveys, however, show this supposition to he false, as the drift in Exchequer is at least 200 ft. east of the west wall and the distance from the west wall to the water channel has heen demonstrated to he 200 ft. farther, so that the Exchequer drift must he at least 400 ft. east of any west wall water.

The third theory advanced as to the sonrce of the water is that it comes from an extensive hody of quartz lying in the east country. The correctness of this can hardly he disputed when it is remembered that four years ago, on the 2400 level of the Exchequer, near the Alpha line, the drift rnn on the east side of the vein strnck a stream of water of ahout 10 miners' inches. The drift was immediately stopped and hulkheaded and a drift was started to the west, which drift was extended through the Exchequer mine without encountering any water, and in this drift and to the west of the water were encountered the streake of ore which have led so many people to believe in the existence of ore in the Exchequer mine. It seems now very prohahle that the Exchequer drift on the 2800 level has encountered the same water discovered four years ago to the east of the ore-hearing quartz, and that thie water is in itself an almost certain indication of ore-bearing quartz lying to the west of it. Add to this the indications of the diamond drill run 18 monthe ago on this level, and the pieces of quartz washed out hy the water, which yielded low assays, and it hecomes a certainty that the water on the Exchequer 2800 level comes from an immense qnartz hody, prohably extending several hundred feet ahove the 2800 level, and which, when drained, will in every prohability reveal an ore body.—*Enterprise.*

THE Girard mill of 20 stamps was started at Tombstone on the 16th.

Treating Low Grade Ore.

The *Register-Call* (Central City, Col.) thus describes the new concentration works of the Rara Avis Co., in Eureka Gulch:

The ore is trammed in cars from the adit workings to the mill building (situate at the mouth of the adit), and dumped into an ore house, which forms an L to the mill building. The ore is then put through a Champion crusher—an improvement over the Blake pattern—and thence it passes by an automatic bucket feeder to a Thompson pulverizer, 40 inches in diameter, which has two cylindrical side issues 40 inches in diameter, the screen issues being of 40 mesh, through which all ore treated by the pulverizer discharges. The principle of the pulverizer is centrifugal force brought to bear within a certain circumference by means of the ore coming in contact with three cast iron balls weighing 200 lbs., the ball pulverizing the ore fed into the pulverizer to a degree of fineness to admit of its discharge through a 40 mesh screen, or finer, if deemed necessary. Below the pulverizer is placed a table, which is to be covered by amalgamated copper plates, and over which the ore runs through the pulverizer passes. This is for the purpose of amalgamating the free gold contained in the matter undergoing treatment. From the amalgamated table the ore passes through troughs to a tank and elevator to an upper tank, from whence it passes to concentrators, one of them being what is known as an Embry, which is nothing more nor less than an endless belt operated by jig motion, being applied by eccentrics. Alongside of the Embry are four of Bradford's concussion tables covered with rubber and so arranged as to separate the slimes or gangue from the mineral. The discharge at the foot of the tables works automatically by a simple contrivance, that of a sliding division gate—it might be termed—the slimes or refuse passing off to one side and the clear mineral to the other. Should the slimes contain values to a certain percentage, they are returned and submitted to further treatment.

The mill has a capacity of from 40 to 50 tons of crude ore per day. The motive power is that of a 70-horse power boiler and a 70-horse power Wells patent balance engine. At present the company are utilizing 25-horse power, which is amply sufficient to speed the mill to a proper capacity. A spring of living water inside the mill building affords an ample amount of water for steam purposes. The water used in the Thompson pulverizer and on the tables is collected from the drainage of the level and gulch and deposited in large sized tanks. Those best acquainted with the details of the mill workings claim that two miners' inches of water is all that is required to successfully treat ores. It will require several days yet before the success of the works can be fairly demonstrated.

Men in the Montana Mines.

The Helena *Independent* says: The quartz mines surrounding Helena now furnish employment to nearly 2,000 men, and as yet not one-tenth of the discovered mines are being worked beyond what is necessary for representing each year. We give below a list of some of the principal mines, but this list is necessarily incomplete, for although there are many other mines that are now being worked, we are not advised as to the number of men employed in each:

Alta Montana	180
Gregory	135
Gloster	130
Belmont	70
Legal Tender	51
Drum Lummon	30
Empire	25
Bonanza Chief	18
Lee Mountain	15
Hickey	14
Bald Butte	14
Poor Man	12
Union Lode	10
Stemple	10
Little Jennie	12
Iron Age	5

In addition to the above there are a number of mines working from three to ten men, and perhaps 200 others that are being slowly developed by the owners with the assistance of one or two hands. It will be safe to estimate that these altogether furnish employment to as many more men as contained in the list above given.

In addition to the miners there are probably 400 men engaged in ore-hauling, chopping wood, burning charcoal, and procuring fluxing material, which would run the list of men which the quartz interests surrounding Helena actually employ, up to about 2,000. This force, if working in one camp, would be sufficient for the nucleus for a city of 10,000 inhabitants. As it is, Helena of course derives the benefit. The sum of money paid to these men monthly amounts in round figures to $200,000. It is safe to say that this sum will within three years or less be increased ten-fold.

THE January product of the Tombstone district, Arizona, is reported at $375,000, of which $121,800 is credited to the Contention Con., $110,000 to the Tombstone, and $100,000 to the Grand Central. The Tombstone *Nugget* of Feb. 4th says that the Grand Central has paid $650,000 inside of a year.

THERE are now seven mills in operation in the Bodie district.

Useful Information.

Painting of Cement and Plaster.

Much difference of opinion prevails respecting the question of painting Portland cement, and we have seen work painted a few weeks after the cement had set, which has stood well. There is one point which has a great deal to do with the question of successful painting, namely, the absorbency and dryness of the brickwork itself. Many new walls saturated with moisture are cemented, and in this condition no paint can possibly stand, if laid on too soon. It is a good and safe rule to enforce, that Portland cement work should not be painted within a year of its completion, to allow it to dry thoroughly; but we are safe in saying the majority of new fronts are painted before they have been finished three months. A very desirable precaution seems to be to coat the work with linseed oil first.

The painting of plaster work requires the same care, and the lime works out in small bubbles, destroying the paint. In painting plaster, white lead and linseed oil, with a little drier, is recommended by one authority. This coat should be of the consistence of thin cream, so that the oil is absorbed into the plaster in a few hours. In a day or two another thicker coat may be applied, and a third a few days after rather thicker, followed by the finishing coat. Four coats are not too much for good work. By the absorption of the oil into the plaster, the surface becomes hardened, and may be washed. Another method to facilitate this absorption is followed by painters, which is to give the plaster two or three coats of boiling linseed oil, and then to apply the other coats of paint. We are inclined to think the application of the oil before the paint a better plan, to insure a thorough saturation of the material. The color of Portland cement, and the uneven tints it sometimes assumes, is the main reason why painting is resorted to. For this reason, we think it may be worth the attention of manufacturers to turn their consideration to the subject, and those using cement as a stucco, might also prevent a blotchy and uneven tint by attending to the preparation of the wall and the sand they use with the cement—*Wood and Iron.*

TO CLEAN INCRUSTED SUPPLY PIPES.—A correspondent of an exchange writes: "One of the most annoying accidents that can happen to the steam engine runner, is to have his water supply pipes choked up with lime and other solid incrustations. Especially in the hot water pipe lime is apt to settle and incrust on the iron pipes, till they become completely filled up, so that no water whatever can pass to the pump or injector which forces it into the boiler. In such cases it is customary to take up the pipes and try to loosen the solid matter by pounding on the pipe and breaking it out, or by making a fire along its whole length and burning it out. In a very recent obstinate case one end was stopped up with a plug, and, standing it upon end, coal oil was poured in as long as any would go in, and the whole was left to stand till morning, when the whole was slid out in a solid core. While this may not always work, it is certainly worth trial in obstinate cases."

HOW TO MAKE BROWN BRASS.—The following recipe is said to produce a good brown tone upon brass: The article, having been thoroughly cleansed and freed of all traces of grease, then polished, is dipped for about half a minute into a cold solution of 10 grains of hypomanganate of potash, 50 grains green vitriol, 5 grains muriatic acid, and 1 liter water; then rinse well and dry in soft sawdust; if a reddish cast is desired, dip the article into a second bath heated to 60° C., of 10 grains chromic acid, 10 grains chloric acid, 10 grains hypomanganate of potash, and 50 grains blue vitriol (sulphate of copper) dissolved in 1 liter water. The latter mixture alone produces a light bronze. The article may afterward be heated in an oven, which operation, it is said, produces a very rich tone.

GUT BELTING is made chiefly of sheep's entrails. They are on an average over 50 ft. long, and after being cleaned, are put into brine, when they shrink in thickness very much. They are then treated as if they were twine to make a round rope from, or they are connected in strands and woven on a loom into flat belts in the same way as ribbon is made. They are now made in Oakland, Cal., round ones, from one-sixteenth to one and one-half inches in diameter, and the flat ones of any size desired. They are so strong that a three-quarter-inch round belt will stand a strain of over seven tons, and a three-eighth-inch, consisting of 150 strands, almost half as much. They are claimed to last 10 years, while the best hemp rope, with the usual usage, scarcely lasts three years.

CORNSTALKS AS FUEL.—An Iowa farmer who has both wood and coal on his farm burns cornstalks for fuel to warm his house, and claims that they make the best and cheapest fuel he can get. He uses a large stove, and burns the stalks in tightly-bound bundles, weighing about 40 lbs. each. A bundle burns three hours (without flame) in an air-tight stove. The large stove offers so much radiating surface that it does not need to be very hot. Five bundles a day, or 600 for the winter, suffice to keep the stove going and the house warm.

SOME curious reactions of milk have been noted by M. C. Arnold: If a little tincture of guiacum be added to fresh milk a blue color is produced; but milk heated to 80° or more remains unchanged. Sour milk assumes the same tint, unless the reaction is checked by the use of mineral acids and alkalies. When a little paste starch mixed with iodide of potassium is introduced into milk to which old oil of turpentine had been previously added, a fine blue hand appears at the surface of contact and spreads rapidly. Milk freed from albuminous matter does not give this reaction. If to fresh milk there is first added acetic acid to precipitate the caseine, then some caustic potassa, and lastly a trace of a solution of sulphate of copper, the violet reaction characteristic of peptone does not appear, but if the milk is allowed to stand 15 to 20 hours before this treatment, the violet color is obtained. The blue color, the author thinks, is the result of ozone.

WHAT MAKES CORN POP?—Chemists who have examined Indian corn, find that it contains all the way from 6 to 11 parts in a hundred (by weight) of fat. By proper means this fat can be separated from the grain, and it is then a thick pale oil. When oils are heated sufficiently in closed vessels, so that the air cannot get to them, they are turned into gas, which occupies many times the bulk the oil did. When popcorn is gradually heated and made so hot that the oil inside of the kernels turns to gas, this gas can not escape through the hull of the kernels, but when the interior pressure gets strong enough, it bursts the grain, and the explosion is so violent that it shatters it in the most curious manner. The starch in the grain becomes cooked and takes up a great deal more space than it did before.—*Agriculturist.*

TO DETECT LEAD IN TIN VESSELS.—For tinning kitchen utensils a very impure tin is used, containing lead in more or less quantity. Considering the dangerous nature of this sophistication, it will be well to have a ready means at hand to determine if the tinning of a vessel contains lead. For this purpose a small bit of tin is detached and put into a watch glass, with a drop of nitric acid and two or three drops of water; the glass is then gently heated over a flame, and when the solution is complete a few drops of water and a concentrated solution of iodide of potassium are added, when, if lead is present, a yellow precipitate will be the result.

GAS-FITTERS have recently made a most useful application of photography. They photograph the gas flames given by different burners or jets, so that a customer can see if the shape and form of a light will suit him before he gives his order. As the flames are moreover depicted "life-size," the purchaser can always tell whether his jet is up to the standard.

Good Health.

RAPID BREATHING AS AN ANÆSTHETIC.—Dr. M. T. Yates, in a letter published in the *Bibli cal Recorder*, says of the surgical operation to which he has recently submitted: "My doctors said that they had seen it stated by an American doctor that if a person would breathe as rapidly as possible under an operation, he would not feel the pain of cutting, and they wished to try it on me, to which proposition I assented. Dr. MacLeod superintended the breathing—which was like that of a dog on a hot summer day—holding, out of my sight, a handkerchief in his hand, to be dropped as a signal when he saw the color come to my face, for Henderson, the operating doctor, to go ahead. When MacLeod told me, 'That will do,' I was surprised to find that the operation had been performed. This I have tried three times, and have not at either time felt more pain than is usually inflicted in the case of vaccination. I heard the knife rip through the flesh like the sound produced in cutting leather, but did not feel the pain. What is the philosophy of this kind of an anæsthetic? Is it simply a diversion of the mind?—*Richmond Herald.*

COLD FEET.—The association between cold feet and sleeplessness is much closer than is commonly imagined. Persons with cold feet rarely sleep well, especially women; yet the number of persons troubled is very considerable. This is the plan to adopt with cold feet: They should be dipped in cold water for a brief period. Often just to immerse them and no more is sufficient; and then they should be rubbed with a pair of hair flesh-gloves, or a rough Turkish towel, till they glow, immediately after getting into bed. After this a hot-water bottle will be successful in maintaining the temperature of the feet, though without this preliminary it is impotent to attempt to do so. Disagreeable as the plan at first may appear, it is efficient, and those who have once tried it continue it, and find that they have put an end to bad nights and cold feet. Pills, potations, "night-caps," and all narcotics fail to enable the sufferer to woo sleep successfully. Get rid of the cold feet and the sleep will come of itself.

ROAST PORK is the hardest food to digest known to the domestic table. It requires over five hours for the process after being taken into the stomach. Boiled rice will digest in one hour, roast or boiled mutton in three hours, turkey in two hours, beef, fried, four hours, roast or broiled, two and a half hours.

HAD HIS HEARING RESTORED.—A rather singular occurrence recently happened near the Western and Atlantic crossing on Alabama street, says the Chattanooga (Tenn.) *Times*. Mr. F. Matthews, track master of the Alabama and Great Southern road, has been totally deaf in his left ear for a number of years, caused by cutting railroad iron in a repair shop, and has consulted a number of prominent physicians and auriculists without deriving any benefit from them. A switch engine was standing near, as Mr. Matthews was crossing the track, and, starting up at that moment, the wheels suddenly slipped on the rails, while a heavy jar ensued, followed by a sharp rush of escaping steam. As soon as the noise had in a measure subsided, Mr. Matthews remarked to a friend standing near that his ear had cracked, and began to pull out fragments of some substance which seemed as hard as rock. Upon further investigation he found that his hearing had been entirely restored, and that what experienced men had failed to do had been accomplished by one of the most natural and ordinary occurrences of every day life.

THE SUNNY SIDE OF DEATH.—Take the sunny side of death. Sooner or later it must come to all, and at the latest it is only a few swiftly-passing days distant. Kings and potentates have no refuge from the summons of the dread messenger. Death is the great leveler of man, and dust to dust is the heritage of all. Why, then, should we shrink from its contemplation? Why banish it from our thoughts with a shudder? It is not rational to permit death to shadow our lives; nor is it rational to turn in terror from what must as surely come as to-morrow's sun. Those who are suddenly chilled day after day by the thoughts of death, either shadow their lives by misdeeds or reject the philosophy that should make every well-ordered life wait serenely for its end. The rational apprehension of the upright man is, not that he may fall too soon in the race, but that he may linger too long and outlive everything but hope.

SUGAR MEAL.—A new danger has appeared in feeding "sugar meal," which is sold by the glucose factories for fodder. This meal is supposed to be the non-starchy part of corn, and to have come in contact with nothing but water in the course of its preparation. If this were true there ought to be no harm in feeding it when fresh. The fact is, that in the vicinity of Buffalo, N. Y., it has gained the reputation of sour meal, from its strong acid taste. An unusual amount of cholera infantum has lately prevailed in a city in the western part of New York State, which is claimed to be due to the acid in the milk of the cows fed on this meal. Cheese-makers have had such bad luck in making cheese, which they claim, also, is due to the acid in the meal, that they have, in many instances, refused to receive milk from dairies where this milk is fed.

AILMENTS PRODUCED BY TURPENTINE FUMES. The effects of turpentine on some 300 painters having been studied by a French physican, he now publishes the conclusions, namely, that these effects can never be so severe as to cause death, unless they be volatilized in an extremely confined space—also, that where there are free movement and good ventilation, no liability to fatal accidents exists. The vapors of turpentine coming from different sources, it appears, have not all the same energy, that of the French product, for instance, being far less injurious than the Hungarian or American. The most general form of indisposition exhibited—usually among new workmen, and directly attributable to the turpentine—are headache, watering of the eyes, coryza, cough granulations on the larynx, and disordered digestion.

WHAT TO DO FOR A SICK-HEADACHE.—Don't take a cup of strong tea, nor a dose of "blue mass," or a lot of anti-billious pills, but drink a pint of warm (not hot) water. Keep on drinking until vomiting is induced. That is the better way to relieve the stomach of its undigested, decomposing mass of food. If anything more is needed, take a hot enema, apply hot fermentations to the bowels, and drink freely of hot (not merely warm) water. Eat little or nothing for 24 hours, then commence with fruit or some simple diet, avoiding meats, butter, pastry, and all other indigestible food.

DIED FROM HAVING HER EARS PIERCED.—A Brooklyn girl, of 18, died the other day from the effects of having her ears pierced. A few days before Christmas she was told that she was going to have a pair of earrings for a present, and in order that she might wear them on the holiday, she immediately had her ears pierced by her brother-in-law. Unfortunately she caught cold, and three days later erysipelas set in, which was followed by meningitis, and after lingering about a week she died.

MINING PRIMER.—Oh, gimmineddi! What is this? This is a hoisting works. What is it for? It is used to hoist the price of stock. But sometimes the price is so heavy that you could not hoist it with a ton of nitro-glycerine. Do they ever use hoisting works for any other purpose? Oh, yes; sometimes they use them to hoist ore into the mine before an expert comes to examine it. Then the expert makes mistakes. What does he do then? Oh, he blames it on the general manager. Do editors ever have hoisting works? We should extemporize. What for? To hoist in liquid philosophy.—*Esmeralda Herald.*

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SAN FRANCISCO:

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Passing Events.

During the past and previous week the final arguments in the now famous Gold Run hydraulic mine suit have been presented to the court. Space prevents our presenting entire the exhaustive arguments of the learned counsel on both sides, though we give, in another column, an abstract of some of the speeches. Within a few days now this most momentous question will be decided by Judge Temple, although, no doubt, it will have yet to go before the Supreme Court of the United States for final adjudication, no matter which one wins.

The weather this week has been disappointing. Up to hour of writing (Thursday afternoon) no rain has fallen, though the indications are favorable.

Meetings were held in this city and all over the State, as well as in Oregon and Nevada, last Saturday, to express the wishes of the people in favor of restricting Chinese immigration. These were well attended by enthusiastic crowds. The bill on this subject before Congress has passed the Senate.

THE Richmond Consolidated Mining Co. has just paid a quarterly dividend of $2.50 per share at London, aggregating $135,000, and making a total to date of $3,637,600, equal to $67.87½ per share. The mine adjoins the Eureka Consolidated, which has not paid a dividend since last year, and which only produced $60,000 in January.

THE Leeds mine is again producing bullion, but it owed $13,115 on the 1st.

Talk up Your Camp.

It has generally happened that the most successful mining camps have been the best advertised camps, as, for instance, Leadville, Deadwood, Tombstone, Bodie, Wood River, Butte, etc. If the people in these camps sat still and never said a word about their mines; if they did not establish newspapers to disseminate news about them; if they did not write about them and talk about them, and tell people what they were and what they were expected to be, and generally "blow their own horns," then none of these camps would be one-quarter as much developed as they are now. Mines alone will not make a successful mining camp by any means. We all know lots of places where there are good mines, but no "boom" has struck them, and no attention is paid to them.

Every mining camp wants capital, and every mining camp wants—talk. The mines bring the prospectors, the prospectors make the talk, the talk brings the capital, and the capital brings the coin. Then the camp becomes a camp indeed.

The talk has been as potent a factor as the mines, the people or the capitalists. If it had not been for that, people would have gone elsewhere where there was talk. What is the use of good mines, if no one knows about them? Of what service is a camp that cannot get people to examine its mines?

In fact, we know of a number of instances where a camp has been made temporarily by talk alone, no mines worthy the name being there. But the examples serve to show the truth of the argument that talk exercises a potent influence in making mining camps.

Therefore let us hear from you. The way to talk to a good many people at once is to print what you want to say. To men in small and large mining camps everywhere we open our columns and extend an invitation to them to tell us about their claims and other people's claims; their prospects and other people's prospects; and those of the camp generally.

What you find time to write several thousand people will find plenty of time to read. This will create talk and help your prospect, your mine and your camp, in the end. When the camp is mentioned people will know about it. They will not suppose, from not having heard of it, that the camp was only discovered yesterday. They will recollect having read in the MINING AND SCIENTIFIC PRESS what you said about the mines, the roads, the timber, the water, the formation, the climate and all the points which you tell us about.

Don't wait then till "some day when you have time," but sit right down and send us a letter descriptive of the region you are in. Never mind about the spelling, or the writing, or the grammar, we can get plenty of that here. What we want is the news of the camp, and we will put it in shape for publication. Who speaks first?

On the Occurrence of Vivianite in Los Angeles Co.

[Written for the PRESS by HENRY O. HANKS, State Mineralogist.]

Among a set of samples from Brea ranch, Los Angeles county, sent recently to the State Mining Bureau by Mr. J. W. Redway, of Los Angeles, was one of dark color and earthy texture, containing small nodular masses of a beautiful pale blue color, which were examined and found to be vivianite, or hydrous phosphate of iron. This mineral, which is rare in California, is interesting as leading to the hope that other phosphates, so important as fertilizers, may be found at or near the new locality. There is a specimen of vivianite in the museum of the State University, which is said to be from a California locality; but, if my memory serves me, this is attended with some doubt. It is reported, also, at Young's hill, Yuba county, and near Oroville, Butte county, but no certain information has been obtained.

The Los Angeles mineral occurs with asphaltum at the well-known Brea ranch deposit. The specimen is marked, "Gangue and Country Rock."

The mass is a dark-colored earthy mineral, with streaks and veins of asphaltic substance, the whole being evidently the sandy desert soil blown over and cemented by the former by liquid asphaltum. The vivianite is in small inclosed nodules, never larger than a pea and generally smaller. The mineral is that variety known as blue iron earth or native Prussian blue. It is soft, pulvernlent; under the microscope, crypto-crystalline; before the blowpipe, whitens for an instant, then blackens and fuses to a black magnetic globule. It is wholly and easily decomposed by boiling hydrochloric acid; the solution reacts for iron, which, being separated, the solution gives precipitates with sulphite of magnesia and with molybdate of ammonia. In a closed tube, it gives much water.

The specimen has been numbered 3538, and placed in the State museum, where it may be seen.

The name, vivianite, was given to this mineral by Werner, after an English mineralogist, J. G. Vivian, who discovered it in Cornwall. When pure it has the following composition, as given by Dana: Phosphoric acid, 28.3%; protoxide of iron, 43.0%; water, 28.7%.

Academy of Sciences.

The regular meeting of the California Academy of Sciences was held on Monday evening last, President Davidson in the chair. The following were proposed as resident members: President William T. Reid, of the University of California, Prof. Henry A. Ward, Thomas Brown and M. H. Hecht, and for life membership, John F. Boyd.

Prof. Henry A. Ward read a very interesting paper on "Mammoths," referring more particularly to the *Elephas primigenus*. One specimen of this, as "restored" by Mr. Ward, and now on exhibition at the Mercantile Library hall, in this city, is 16 feet high, and whose length, including the forward curve of the tusks, was 26 ft. or more. The remains of the mammoth are among the earliest animal remains now found, and are noted by writers B. C. 300, who speak of their discovery. Some curious mistakes occurred among those who found the large bones of these animals, and mistook them for antediluvian giants. Such bones brought to ancient Rome were believed to form part of the skeleton of Pallas, and are recorded as being as high as the city walls, when set up erect. Later, at Lucerne, in Switzerland, such bones were exhibited as those of a man 19 ft. high. As late as Feb. 13, 1638, the same thing was done in France, and also Scotland rejoiced in the skeleton of an antediluvian giant 14 ft. high. Later, the mammoth was supposed to be the behemoth of the ancient Hebrew Scriptures. In 1696, the bones of one were collected, and mounted by learned professors and anatomists at Gotha, in Germany, who declared it was not an elephant, but the one they had was simply a *lusus naturæ*. It was finally reserved for that great French naturalist, George Cuvier, to dispel the darkness in January, 1796, when he boldly announced that all such bones were the remains of fossil elephants, differing from any now living upon earth. They have now been found all over the continent of Europe, in the pliocene and post-pliocene strata. In Asia there are vast quantities of such bones found on the northern limits of the continent, within the Arctic circle. Siberia, along the Yenesei and Lena rivers, emptying into the Arctic basin, the Liakow or New Siberian islands, and the bed of the Arctic ocean, crossed by the crew of the *Jeannette* in their retreat to land, all are said to be thickly covered with bones of this class, abounding in fossil ivory. Many huge masses of bones have been piled up by freshets from rivers running northward and emptying into the Arctic. Huge masses of this ivory are annually shipped to England and there cut and utilized in the arts and manufactures. The Yakouts, or natives of that part of Siberia, formerly supposed these enormous animals to be a species of huge moles, that lived and burrowed under ground, and because their remains were found beneath the surface, they thought they lived and died there. The word mammoth is a native Yakout word, meaning in their language "an animal that burrows under ground"—and the world has adopted it as a popular word. They are most abundant in the far north, and become less and less frequent as the distance from the Arctic basin increases. Prof. Ward thought their long black hair and thick skin would enable them to exist in a temperate and, perhaps, a frigid zone. A mammoth was discovered frozen in latitude 72°, near a river, with his flesh frozen, and skin in place. In 1772, in latitude 64°, on the river Lena, a whole rhinoceros was discovered. In 1799, a Tungusean fisherman discovered in latitude 70°, near the mouth of the Lena, a dark mass in a block of ice, but it was too deeply imbedded to get at it. In 1804, he returned to the spot and found the ice block rent and fissured. The perfect mammoth had fallen out by its own weight. The hide was heavy, and had over it thin but long black hairs. The Yakouts fed their dogs upon its fresh meat, and white bears and Arctic foxes also joined in the feast. Branches of the woody twigs of trees were found undigested in its stomach, when, in 1808, a British traveler and scientist visited the carcass. He collected the bones, took 40 lbs. of black hair and one side of its hide, which he transported fully 7,000 miles to St. Petersburg, where they were purchased by the Emperor Alexander for 8,000 roubles, and deposited in the Imperial Academy of Sciences there. They have since been set up, and pieces of the skin and hair have been donated to the Paris Academy of Sciences, and to the Royal College of Surgeons, in London. Prof. Ward said there were two hypotheses entertained by scientific men in regard to how these animals came there in such large numbers. One was the hypothesis of a complete change of temperature by a sudden cataclysm; and the other, the gradual depression of the land, continuing through ages. In Europe the mammoth seems to have been coeval with early man. On the tusk of a mammoth found in a cave at Dordogne, in France, is carved with a flint implement a good likeness of a mammoth. Their remains are found more or less on every continent except Australia, which many geologists consider of recent formation. All our American valleys appear to have had their great herds of such elephants, which have now disappeared from our soil. Nearly 30 different varieties have been found. In Missouri a stone arrow-head was found imbedded under the shoulder-blade of a mammoth now in the British Museum. At Racine, Wisconsin, was found an ancient drawing of a mastodon, certainly drawn from life by men. Over a bushel of chewed twigs and succulent branches were taken from the stomach of the one found in the block of ice at the river Lena.

Prof. Joseph Le Conte read a paper by himself and Prof. Rising, giving the results of investigations on the phenomena of metalliferous vein formation now going on in Lake county, at the Sulphur Banks mine. Some of the phenomena described were referred to in the MINING AND SCIENTIFIC PRESS of August 1, 1879, and also in the "Quarterly Journal of the Geological Society" of August, 1875. Recent developments in the mines, however, have given much better opportunity for observation than before existed. The paper was at some length, but very interesting, and we shall endeavor to obtain it for publication.

Prof. George Davidson presented some observations on the temperature of air and water at the Golden Gate. We shall publish the facts gained in this investigation.

Prof. Ward announced that his collection of casts, etc., was now on free exhibition at the Mercantile Library hall, on Bush street.

Ore Concentration.

As the necessity for working low-grade ores becomes more apparent on this coast, the benefits of concentration are more fully considered. If we can get rid of a heavy mass of gangue, and take only the comparatively valuable portion of a lot of ore, we can afford to transport and treat it, when we could not if the major portion of the gangue were not eliminated in the first place. As more people turn their attention to the subject of concentration, new ideas are brought to the study, and new machine result. We have this week two to consider, both of which have just been patented through the MINING AND SCIENTIFIC PRESS Patent Agency.

The first is that of Edward Stahl, of Prescott, Arizona, whose concentrator consists in a passage, or channel, in open relation with a series of chambers below said channel, having at one end an inlet for a stream or head of water, and at the other an outlet therefor, and having a hopper through which the ore is fed into the stream below.

He has a sort of long box or channel having different receptacles below its floor or bottom, all opening into it. At one end is the water pipe or cylinder which is high enough to obtain the required head of water. Into the top of the channel opens a hopper at the same end as where the water enters. Water is poured into the pipe, and the discharge end of the channel being smaller than the supply end, the said water fills the channel and rises in the hopper to the brim. This water fills all the chambers in which and in the hopper it is in a state of comparative rest. The current passes through the main channel, its exit being controlled by a gate. When the water is passing through and the hopper full the ore is fed into the hopper, where any light substances, such as chips, scum, etc., will float off. The ore sinks into the channel; here it encounters the current of the stream and portions of it are carried by it to different distances. By this means separation is effective. According to their respective densities they will be carried onward by the current, those having greatest specific gravity settling in the first of the series of compartments, and so on. The device may be made any length to suit the treatment of ore in hand. The limit to the capacity is the amount of water obtainable.

Another invention in this line is that by Joseph S. Duncan, of this city, which consists in the employment of a pan to which a rotary motion is given and at the same time a shaking or oscillating motion, whereby an advantageous effect is produced upon the auriferous earth and sand which are deposited on the pan over its outer edge. The earth, sand and water are put upon the revolving pan at its outer edge and fall into a channel there formed. The centrifugal force has a tendency to throw the heavier or precious particles to the extreme outer edge, while the oscillating motion of the pan settles them to the bottom. As the operation is continued and the material is constantly thrown up against the outer rim, the channel becomes filled with the precious particles, while the sand lies on top and is filled up against the rim, forming a downward grade to the center of the pan, and it can be easily drawn off at the center. A further advantage of this rotating pan is that the time it takes for the water to pass from the outside to the center, where it is wasted through the hollow king post, is increased, thus giving the particles time to settle from the water. If the pan were stationary the water would flow directly from the periphery to the center, and, having but a short distance to cover, would be likely to carry some of the precious particles with it and waste them; but by revolving the pan the water is forced to take a spiral course to the center and thus cover greater space, giving the particles time to drop out. As a consequence of this an increase in the volume of water is felt more gradually and there will be no rushing force to the center. Suitable arrangements are made for drawing off the precious metal. S-shaped flanges are placed near the center of the pan to break the force of the water, conduct the water to a central aperture and discharge it directly. Without them the water would not pass off easily. A protecting plate prevents splashing.

THE Northern Belle's reserve had been reduced to $47,569 on the 1st.

On Minerals.

[Notes of a Lecture delivered before the Mechanics' Institute by A. W. Jackson, Jr., Instructor of Mineralogy, Petrography and Economic Geology, at the University of California

(Continued from Last Week)

You will recogniza some of these minerals as I name them. The commonest and most important of all are the feldspars, with which you are familiar as the dall, white or red constituent of granite. It is the mineral which gives the beautiful red color to Scotch or Aberdeen granite. It is not only a constituent of granite, but enters into the composition (except of sandstones and limestones) of nearly every other important rock-mass on the face of the earth. It is so important that in determining the nature of a rock, about the first thing to be considered is the nature of the feldspar it contains. I speak of feldspar as a single mineral; the term really comprises a group of minerals, differing from one another to the extent that some contain potash, while others contain soda and lime in varying proportions; while all contain alumina. In physical properties, however, color, form, hardness, they resemble each other very closely, and they all play the same *role* in the make-up of the rocks. As a final product of their decomposition, we obtain pure white porcelain clay, the most essential raw material for fine porcelain.

Two other minerals or rather groups of minerals of this family, viz., the hornblendes and the augites are secondary only to quartz and feldspar as rock constituents. While the feldspars are always of a lighter color, these two minerals are dark green to black, and impart the dark, somber colors to syenite, basalt, and such rocks. Hornblende is the dark constituent of the Penryn and Folsom "granites," used in the S. F. Stock Exchange building, and the black blotches that here and there mar the polished surfaces are due to local aggregations of the granular of this black mineral.

Garnet and tourmaline are both members of this family, and both are familiar in that they furnish gems of somewhat inferior quality.

Red garnet is frequently seen in jewelry. A most exquisite emerald-green garnet was recently sent to the University museum from Auburn, in Placer county, that only needs to be found in somewhat larger crystals to become a valued gem. Its color is as clear and pure as that of the finest emerald. It may be looked for in the vicinity of chrome iron deposits. *Tourmaline* is of most complicated chemical composition, containing never less than 10, and sometimes as many as 16, different elements. It occurs in all colors, and is one of the few minerals that show pyro-electricity. The gems from garnet and tourmaline are inferior because of their inferior hardness and less brilliant luster. The true emerald and true topaz also belong here; both are inferior in hardness and lustre to the Oriental emerald and Oriental topaz. The emerald is the green variety of the mineral beryl, while the topaz is a simple silicate of alumina. The emerald, on account of its exquisite green color is most highly prized as a gem, while the topaz has rather gone out of fashion.

I will mention but two other minerals of this family, viz., nephrite and jade, and in connection with them, call your attention to the not unimportant assistance which mineralogy is beginning to render in the solution of ethnographic and anthropological problems, which, up to the present time, have been studied from the historical, linguistic and physiological sides only.

Jade and Nephrite

Are both green minerals, quite hard, and about the toughest substances known among the stony minerals. They were selected by the prehistoric peoples of New Zealand, Siberia, China, Mexico, Middle and South America for their stone implements and various other stone objects. In parts of China and Siberia they are still used for the same purposes. We can understand how it should be so in these countries and in New Zealand, because large deposits of the mineral occur within their boundaries. But, in spite of the fact that large numbers of prehistoric ornaments have been found in Mexico and South America manufactured out of jade and nephrite, not a single natural occurrence of these substances in North America or South America is known to-day. It is furthermore proven that the raw material of all of these American stone ornaments came from China; and, by means of the peculiar microscopical texture of the mineral from different localities, it is possible to point out the precise locality in Asia from which the raw material for any given American prehistoric nephrite or jade ornament was obtained. You at once perceive the significance of this fact, establishing as it does a connection between this coast and Asia that long antedates our present civilization. Mineral ornaments and objects are among the most imperishable records that have come down to us from the remotest antiquity, and the foregoing is but one of many instances that might be cited where a study of these records may throw light upon the early migrations of people or early commercial connections between different and perhaps widely separated peoples. Of the origin or mode of formation of the minerals of this family I will speak at my next lecture.

Zeolites.

The minerals of the family of scleritas contain no water. It is quite characteristic of the zeolites that they contain considerable water, which they readily yield up on being heated before the blowpipe, with a boiling motion, whence the name, from zeo, to boil. About 40 zeolites are known; they are mostly white or colorless, occur in beautiful crystals, very commonly in hollow cavities of rocks consisting of minerals of the previous family. They are formed from the *leachings* of these minerals and crystallize out from this water solution at the first convenient opportunity, viz., in the little cavities just mentioned. They occur rarely upon silver and copper ore veins, while the anhydrous silicates never occur there.

Micas.

The commonest micas are very familiar. They are the thin black and white scales seen in granitic rocks; that is altogether their characteristic mode of occurrence. These scales rarely attain the considerable size that fits them for use in the arts. Much of the mica used in this country is from the mines in North Carolina. These mines are really in exceedingly coarse-grained granite. In granite, as we ordinarily see it, the grain is very fine, and the mica scales useless. The constituents of granite, however, sometimes take on colossal dimensions. The feldspars and quartzes weigh tons, and the mica scales are 6 ft., more or less, in diameter. It is then, of course, possible to work it.

The familiar substance soapstone—so called from the smooth, soapy feel—is a mica, only the mica scales are too minute to be recognized as such by the unaided eye.

Finally, porcelain clay—the purest form of common clay—is also a mica. It consists entirely of minute, diamond-shaped scales, recognizable as such only under the microscope. It is formed from the total decomposition of the feldspars, and is the final insoluble residue after everything else has been dissolved out.

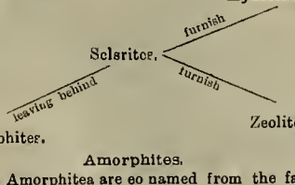
Amorphites.

You obtain the best conception of the minerals of this family if I tell you at once how they are formed. If you will observe any dark crystalline rock, like basalt, that has been exposed to the weathering action of atmospheric waters for a considerable period, you may notice along the cracks that fissure the rock in all directions, that the rock is *bleached*, has lost its color in immediate proximity to the crack; has turned, perhaps, perfectly white, the color gradually deepening as you recede from the crack into the mass of the stone, where it assumes its normal dark color. The cause of this change of color is the leaching effect of the atmospheric waters that I have already twice referred to.

Basalt is made up principally of feldspar, augite, olivite, and magnetite. These minerals contain soda, Na_2O; lime, CaO; iron, FeO; magnesia, MgO; alumina, Al_2O_3; and silica, SiO_2; while atmospheric drainage water, H_2O, contains, among other things, carbonic acid, CO_2, and sulphuric acid, SO_3. * * *

In a similar way most of the sclerites yield by atmospheric weathering, a process that extends through geologic ages, similar insoluble decomposition products.

You observe, then, the relation existing between the different families of silicates and the order of hydrolites:



Amorphites.

The Amorphitea are so named from the fact that they are devoid of crystal form. They are soft, dull, earthy, colorless, or colored by oxides of iron or manganese. They form an exceedingly important element of soils, together with clay, sand, oxide of iron and humus.

In the formation of soils which, you understand, results from the disintegration and degradation of rocks, the most insoluble and indestructible elements of the rocks, such as those above mentioned, must necessarily aggregate together. From their inconspicuous, earthy nature, they would naturally fail to attract the attention of the ordinary observer.

Under favorable circumstances, however, these amorphites may collect in quantity, tolerably free from clay, sand, oxide of iron, or humus. Two familiar instances of this sort are

Meerschaum and Rock Soap.

The former is sufficiently familiar; the latter mineral bears no passable name, as it really acts in many respects like soap, although, of course, it does not resemble it in composition, being a hydrated silicate of alumina. It can be mixed in nearly equal parts with ordinary soap without in the least deteriorating its quality.

Apyritites.

We come now to the last of the stony minerals, to those, namely, that, with all of the other properties of ordinary stones, are free from silica. We find here combinations of the same bases as above, with some *other* acid than silica, viz., carbonic, sulphuric, fluorhydric, phosphoric and some others. Many of them are quite familiar.

Thus fluor-spar, fluoride of calcium, is cut into ornaments in England, used as a flux in metallurgical works and furnishes a most powerful etching material, fluorhydric acid. It occurs on ore veins.

Calcite, or limestone, known in the arts as marbls, is found in all countries, and is used for the greatest variety of ornamental and useful purposes. It may be of interest to note the great difficulty which sculptors meet in obtaining sufficiently large blocks of marble absolutely free from crack or flaw and of spotless purity of color.

The Parian marble, from the Isle of Paros, and the Cararra marble, from Modena in Italy, famed even with the ancient Greeks, are to-day almost the only materials that can be used. One cubic meter costs $450. Burnt limestone furnishes quicklime, and a peculiar compact homogeneous limestone is used as lithographic stone. There is some possibility that Kern county may furnish this valuable material before long; at the present time it comes from Solenhofen, in Germany.

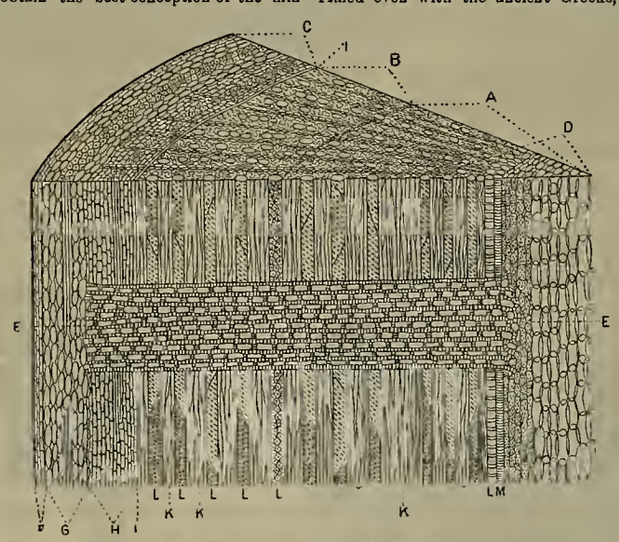
Aragonite is only another form of carbonate of lime. The Suisun marble and the Mexican onyx are both varieties of this mineral. They may be seen in the panels to the counters of the offices of Baldwin's hotel and the S. F. *Chronicle*.

Gypsum, a hydrated sulphate of lime, furnishes our plaster of Paris, and the phosphate of lime, phosphorite, is highly valued by agriculturists as a fertilizer.

The strontium and barium salts are used for colored flames in the art of pyrotechny.

One gem is found in this group—the beautiful blue turquoise, a hydrated phosphate of alumnium; it owes its color to a very small amount of copper. It occure in the form of small veinlets and nodules in quartzite in Persia, in sandstone in Egypt, and in a decomposed rock in Esmeralda county, Nevada. The best gems come from Persia. Those from Egypt change their color rapidly, while the Nevada turquoise has rather an unfortunate greenish blue color that renders it well nigh valueless as a gem. Still, I have seen good gems from there.

(To be Continued.)



SECTION OF TREE MAGNIFIED TO SHOW CELLULAR GROWTH.

The Bodie *Free Press* prints the following: "Several men have been at work off and on during the winter on the eastern slope of this ridge placer mining. When water could be obtained small wages were the result—enough to buy grub. The squaws occasionally make a clean-up of two or three dollars, but the manner in which they operate would not suit a white person. When it comes to patience, a Piute female excels a Chinaman.

The Bullion assessment of $30,000 now in process of collection, will still leave the mine in debt, as on the 1st it owed $20,431.

How Plants Grow.

As the swelling buds and shooting leaves betoken the approaching of another season of activity in our trees and plants, it will be timely to review the subject of plant growth, in order that all may be better able to trace the processes of nature, which culminate in the stalwart timber. To do this, we select paragraphs from a famous essay by Col. W. S. Clark, recently President of Amherst Agricultural College, in Massachusetts, borrowing both text and engraving from this source.

When ordinary cells are united into a more or less extended structure, they constitute what is known as cellular tissue. This may be soft and pulpy, as in the flesh of an apple, loose and tender as in the pith of an elder, firm and tough as in birch bark, or hard and brittle as in the shell of a hickory nut or the stone of a peach.

The tissue of the inner bark, consisting of very long and narrow cells overlapping each other at the ends, is called bast; and that of the stem, in which the cells are similar, but shorter, is called woody fiber. The tubes which are formed are styled ducts or vessels, and, as they are mingled with woody fiber in the annual growth of timber, the ordinary combination of these is named the fibro-vascular tissue.

When these enlongated cells and ducts are straight and parallel, as in the chestnut, the wood of which they are the warp splits easily, but when they are interlaced and blended irregularly, the longitudinal grain of the wood will resemble that of elm.

Every seed and every young plant consists wholly of cellular tissue, but with the development of leaves is combined the growth of fibro-vascular tissue.

The Progress of Growth.

The first vessels to appear in the plantlet are arranged in a circle around a column of tissue, which remains loose and soft, and after the first season dries up and dies. This is called the pith, and seems essential to the life of every woody branch and stem during its infancy, although its special function is unknown. Between the vessels around the pith may be seen the rays of cellular tissue, which ultimately become hard and firm, and which unite in bonds, never broken except by some external force, the inside of the stem with the inside of the bark. These rays make up the woof, and have much to do with the distinctive peculiarities of different sorts of timber.

Immediately outside the vessels inclosing the pith grows a layer of woody fiber, upon which, in a more or less developed state, according to season, is a layer of organizable material, called cambium, which may be regarded as the seat of life of the plant. Next to the cambium, and united to the wood by the rays from the pith, is the bark, consisting of three layers.

The inner or fibrous layer is formed by bast cells and firm cellular tissue. Surrounding the inner bark is a layer of cellular tissue, in which the rays from the pith terminate, and which is named the green layer, because it often exhibits this color in young shoots, and then performs the same function with the green tissues of the leaf. Outside of all this is the corky layer, consisting of dry, dead cellular tissue, and developed annually from the green layer. This is not usually of much thickness or consequence, but sometimes, as in the cork oak of Spain, it becomes an important article of commerce.

The growth of our trees goes on in the cambium layer, from which is produced annually a layer of wood and a layer of bark, each formed of longitudinal fibro-vascular tissue and horizontal cellular tissue.

The Engraving

On this page represents a section, both vertical and horizontal, of a branch of a sugar maple two years old, as it appears in December. The portion included in the lines marked A is of the first year's growth; those marked B indicate the wood of the second year; while those marked C inclose the three layers of the bark. D represents the pith of loose cellular tissue; E, the pith rays or silver grain of hard cellular tissue connecting the pith with the green or middle layer of bark, which also consists wholly of cellular tissue; F marks the outer or corky layer of the bark, which is composed of dry, dead cells which are formed of consecutive layers from the outer portion of the living green layer; G is the green layer or cellular tissue; H shows the liber or inner bark, made up of cellular tissue, penetrated by long bast cells arranged parallel with the axis of growth; I represents the place of the cambium or growing layer of organizable material which descends from the leaves between the liber and the sap wood during the period of growth; K is woody fiber which gives strength to the stem, and through which the crude sap rises; L indicates the vessels or ducts, with various markings, such as dots, rings and spirals, which are formed abundantly in the spring, and usually contain no fluid. They convey gases and aqueous vapors, and it may be that a large proportion of all the water ascending from the roots to the leaves passes through them as vapor. M is the layer of spiral vessels or ducts which always inclose the pith, and in the young shoot extend into the leaves and unite them to the pith during its life, which ceases with the first season.

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Scientific Press **Patent Agency.**

[ESTABLISHED 1860.]

Inventors on the Pacific Coast will find it greatly to their advantage to consult this old experienced, first-class Agency. We have able and trustworthy associates and Agents in Washington and the capital cities of the principal nations of the world. In connection with our editorial, scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other Agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of Patents already granted, for the purpose of determining the patentability of inventions brought before us, enables us often to give advice which will save inventors the expense of applying for Patents upon inventions which are not new. Circulars of advice sent free on receipt of postage. Address DEWEY & CO., Patent Agents, 252 Market St., S. F.

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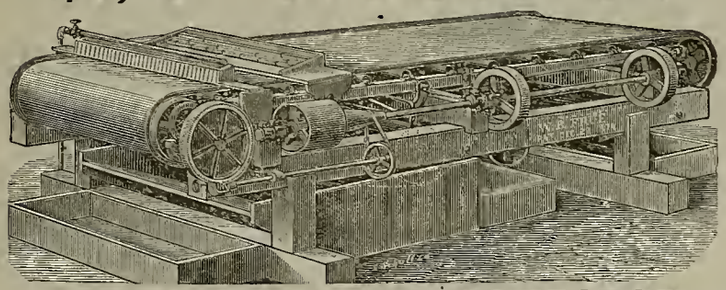
$1,000 CHALLENGE!



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Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.

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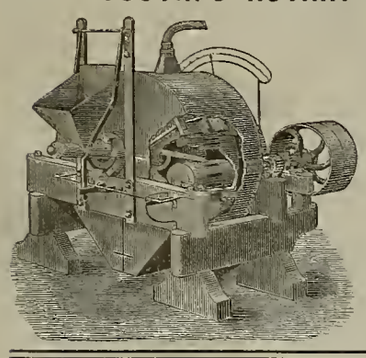

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Patented October 11, 1881.

One of these machines can be seen at the Ore Sampling and Pulverizing works of Hofmann Bros., No 415 Mission St., where it is working every day. Weight 5,000 lbs., heaviest piece 480 lbs.

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Standard and Special Machine Tools.

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—AND—

INGERSOLL ROCK DRILLS.

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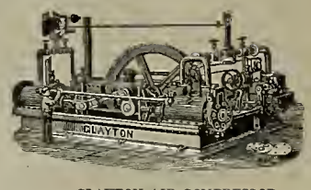

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Nitro-Glycerine Explosive in the Market.

In the suit of the Giant Powder Co. against the Vulcan Powder Co. for *alleged* infringement of Patent, it was held that the Giant Powder Patent was INVALID.

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Each grade superior to like numbers of any other Nitro-Glycerine Powder in the market.

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.
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SHEET IRON PIPE.
Lap-Welded Pipe, all Sizes, from Three to Six Inches. Artesian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.
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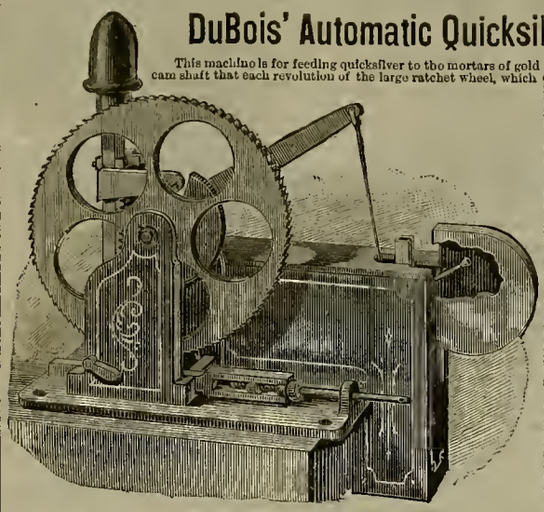
SHEET IRON PIPE.

DuBois' Automatic Quicksilver Feeder.

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.
The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.
A chief point of excellence of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; *i. e.*, from every one to four minutes.
Price, complete, $100.
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It weighs complete, 7,000 pounds It costs $1,500 ready for the belt Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.

Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver ores Chloridizing Furnaces, Retorts, Rock Drills Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies Iron Work complete for Wood Frames, also
SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.
☞Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
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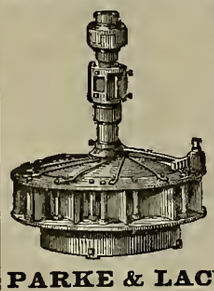
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Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
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Established 1856.
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Extra sizes and lengths made to order on short notice
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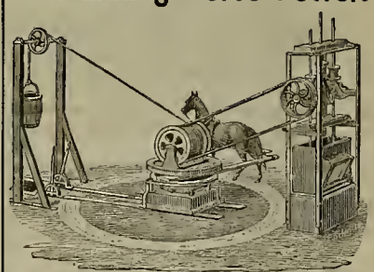
New Mining Horse Power.

The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
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Palmer's Safety Clutch
FOR
ELEVATORS
Will be Applied to Elevators on Short Notice.
☞It is now used in the U. S. Army Building and Grand Hotel, New Montgomery Street.
Agency, 303 Montgomery St., S. F.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING FEBRUARY 28, 1882.

254,269—SLAB OR BLOCK FOR PAVEMENTS—Calvin Brown, Vallejo, Cal.
254,270—GRAIN SEPARATOR—J. Brush, Albany, Org.
254,309—STEAM CYLINDER AND PISTON—W. Hanna, Gilroy, Cal.
254,151—PIPE COUPLING—E. Nunan, S. F.
254,173—ORE CONCENTRATOR—Edward Stahl, Prescott, A. T.
254,177—FEEDER FOR THRASHERS—M. Thomas, Jr., Gilroy, Cal.
254,246—CATTLE CAR—H. Townsend, Alameda, Cal.
254,123- ORE CONCENTRATOR—J. S Duncan, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

FEEDERS FOR THRASHING MACHINES.—Massey Thomas, Jr., Gilroy. Dated Feb. 28, 1882. No. 254,177. This invention relates to that class of agricultural implements knows as "feeders for thrashing machines," which are used to receive the grain and straw placed upon them by the derrick, and which sustain the elevator upon which the straw is raked or held down, and by which it is carried up to the self-feeder, preparatory to being fed into the thrashing cylinder. The usual operation of feeding grain and straw to a thrashing machine consists in forking it from the stacks by means of a derrick and depositing it upon the forward end of the derrick wagon. It is then held down by hand upon the elevators, which carriee it up to the self-feeder, by which it is fed to the thrashing cylinder. This invention has for its object the employment of mechanism to feed the grain and straw to the elevator, and, by a proper construction thereof, so regulate the feed as to dispense with direct manual labor or hoeing it down, and feed regularly and properly to the self-feeder above, thus assisting the self-feeder and aiding the whole operation. Its object is separate from that of the self-feeder, the latter being used to feed to the cylinder, and having to receive its own supply from a source regulated by hand, and, consequently, all the regularity and separating out must be done by itself, while the former is used to precede the operation and feed to it with the regularity and precision of mechanism, instead of employing manual labor.

ORE CONCENTRATOR.—Edward Stahl, Prescott, Arizona. No. 254,173. Dated, Feb. 28, 1882. This patent we refer to more fully in another column.

ORE CONCENTRATOR.—J. S. Duncan, S. F. Dated, Feb. 28, 1882. No. 254,123. We have described this patent in some detail in another column of this number of the PRESS.

GOLD AT STAMPEDE GAP.—It is proven beyond a doubt that deposits containing gold exist out at Stampede gap. Exceedingly rich specimens brought in from there substantiate this fact. Rock from there exhibited on the street was "lousy" with gold. The yellow metal was first encountered in the First Chance mine, and not the Ontario, as stated by us last week. The First Chance, like all the mines in that locality, until lately, was an old, abandoned prospect, and a few days ago was relocated by Tom Brown, Thomas and another man. The ledge is from 8 ft. to 12 ft. in width, and is composed of iron and quartz. Old prospectors, who prospected at Stampede in '70, used to express the opinion that gold existed in that country, and developments prove them correct in their opinion.—*Pioche Record.*

LIEUTENANT A. H. PAYSON has assumed charge of the lighthouse department for this city and moved the office into the Government building on Sansome street. He relieves Lieutenant-Colonel S. C. Stewart, who took charge of the office as a successor of Colonel Williamson when clerk Best was charged with forgery.

UNDER the decision of the Postmaster-General it is understood that all mail contracts in California for which Boone, Salisbury and Cahill, members of the straw bond ring of contractors, were the lowest bidders, will be withheld and readvertised or awarded to the next lowest responsible bidder.

IT is proven beyond a doubt, says the Pioche *Record*, that deposits containing gold exist out at Stampede gap. Exceedingly rich specimens brought in from there substantiate this fact. Rock from there exhibited on the street was "loney" with gold. The yellow metal was first encountered in the First Chance mine,

The Debris Suit.

The arguments in the debris suit have nearly been concluded. On Monday, A. P. Catlin spoke on behalf of the defendant. His argument thus far has been wholly a review of the testimony relative to the question of whether the material of the defendant's mins comes down or not. He holds that the testimony shows that the matter in the lower river is that which the early mines, from 1849 to 1869 placed there, and that all the damage claimed was the result of that material being brought down by the flood of 1861-2, and some little by subsequent floods; that the difficulties of navigation in the Sacramento river culminated in 1875, and that ever since, the navigation has been improving; that the material from the defendant's mine impacts in the American river and remains there, and ever will, a saving exception being made only as to the work of ages to come, concerning which no man may pronounce.

Judge W. T. Wallace, on Tuesday, opened for the defendant. He said that California in 1850 erected this into a State before admission was obtained to the Union. The statutes of 1854 are a memorial of that usurpation. The discovery of gold brought a population here with no idea of agriculture, being only in search for gold. What was to be expected from such a gathering? They gave law to the land; they did not wait to pass through the territorial gate, but sprang over the wall; the people claimed to own California and demanded admission to the Union; they borrowed large sums for their Government, levied taxes, adopted a seal and passed a law to regulate mines, to declare certain streams navigable and to declare against obstructions in the same; but no one dreamed then of mining being in any way an obstruction to the rivers; Sacramento was the child and favorite of the miners for the Capital; then came the admission to the Union and the act to allow miners to make local regulations, thus giving them back a part of the legislative powers; then the act giving to the miners the right to enter upon agricultural lands to mine, on giving a bond; and then the act to exempt miners from taxation; then the act allowing miners to take lands, and then the Drainage act. These were manifestations of power and the policy of it. That the two last acts are unconstitutional does not weaken the illustration.

He cited many cases showing that the courts recognized the rights of miners, under the customs and policy of the State, to appropriate waters, divert and work the streams, etc.; also, cases showing that local mining customs, according with the policy of the State, should be supported.

Custom is the best interpreter of the law. What is done under the law without complaint, is the law. As to reasonable use, it is an integral part of the law of riparian rights. He reviewed the Maryland cass, where one was held for putting into a stream a little blood once a week, and said it was in direct conflict with the case of Keyes vs. The Little York Company, in the Supreme Court of California. The California case is the better law, he said. As to Governmental control of the streams, they were given in trust to the State for commerce. Now gold production has a closer relation to commerce than navigation, which is but a means to commerce. It is a serious question when Congress will say: "Shall the navigation of the Sacramento river be preserved, or shall it be let go in favor of all the gold behind the mining interests?" He wished to be understood as holding no such view himself, but that is what a disinterested Eastern Congressman might say.

In all the butcher and tallow cases cited, the business was not destroyed; they were simply told to move on to a more convenient point. Here the mine cannot be moved on; to stop it, is to destroy it; this is an information and concerns only the rights of the State, and not of any private relators; hence, the Court cannot consider private damages. The hill proposes to practically disorganize seventeen counties, prevent the taking out of $1,000,000,000 to $2,000,000,000 of gold, and to relegate to poverty 150,000 people. The evil complained of is capable of a remedy; all the engineers agree as to that, and one dollar in four hundred will pay the cost of it. The mines will pay all the cost if once given the power. They have not now the power to condemn spots, nor build restraining works or do the needed work. Stopping the mines will not check the advancing wave of debris. So said the Governor in his message, and so say the engineers. Draw a constitutional hill and pass it; give the power to apply the remedy and put the whole burden where it belongs—and that is, on the miners. If the miners are worth all they say, they can well bear the expense.

Counsel then attached the authority of the Attorney-General to bring the suit and cited authorities against his claim. Is the Attorney-General the Attorney-General for but two-thirds of the people, or for all? Where is the Attorney-General for the one-third of the people sued here in their own name? The power exercised here is one for the Legislative, not the Executive Department, to which the Attorney-General belongs.

At the afternoon session, Attorney-General Hart opened his closing argument for the plaintiff. He spent nearly two hours in defending his action as Attorney-General in bringing the suit, citing a great number of authorities.

News in Brief.

EGGS sell for $1.50 per dozen at Hailey, Wood River.

IMPORTANT arrests of Nihilists have been made at Odessa.

THERE are serious signs of a movement among the Poles.

THE Oswego Iron Works, Oregon, turn out about 18 tons of iron a day.

SINCE the flooding of the Gold Hill mines, the flow of water through the Sutro tunnel has been considerably increased. It now averagee 7,205,933 gallons per 24 hours.

THE back water from the Mississippi river extends up the White river to Clarendon, Ark., a distance of 135 miles from the mouth. The entire country intervening is under water.

BY the explosion of a barrow of matte, John Raher, an employee of the Montana Copper company, at Meaderville, M. T., was severely burned about the head and face last week.

MILTON S. LATHAM, formerly Governor of, and U. S. Senator from, the State of California, died in New York this week. He was an old Californian, well known all over the coast.

THE Tucson, A. T., gas works are nearly completed, and the city will be lighted on the 25th of March. The works will cost $120,000, and will have a capacity of 32 000 feet of gas.

THE recent rains brought the long wished for freshet to the streams in Mendocino county, enabling the lumber men to send down their logs. Many thousands were floated down to the sea.

REFUSE cedar is likely to become of market able value. Puget sound loggers have been instructed to forward all the refuse cedar that can be obtained, in consequence of a sudden demand for that kind of lumber in South America.

IN a communication of the Secretary of War to the Senate, a letter from General Sherman is enclosed, in which he says that four-fifths of the army have been for the last 10 years engaged west of the Mississippi, looking after Indians.

THOMAS B. H. STENHOUSE, San Francisco correspondent of the New York *Herald*, died in this city on Tuesday. At one time in his life he was a resident of Utah, and a Bishop in the Mormon Church. Mr. Stenhouse was well known on this coast.

PANAMA advises to the 26th ultimo say: The American Bark, *Legal Tender*, is in port with a cargo of redwood lumber from Eureka, Humboldt county, Cal. There is a good demand for redwood lumber of all kinds, as it is very durable, does not shrink, and the ants, which destroy almost all varieties of pins lumber and timber, do not touch it.

A SUCCESSION of earthquakes occurred at Merced Monday. They continued a number of seconds, and were so heavy as to cause an unceremonious adjournment of the Superior Court in the midst of an important criminal trial, the judge, jury, attorneys, officers and prisoners rushing pell-mell down stairs and out into the court-house yard. At 1:57 two quite severe shocks of earthquake were felt at Santa Cruz, lasting several seconds. Shocks were also felt at Gilroy, Monterey and Watsonville.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

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THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

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San Francisco Metal Market.

[WHOLESALE.
THURSDAY, March 2, 1881.

IRON.—	
American, Pig, soft, ton	— — @35 00
Scotch, Pig, ton	25 50 @27 50
American, White Pig, ton	— — @— —
Oregon Pig, ton	— — @33 00
Clipper Gap, No. 1	— — @32 00
Clipper Gap, White	— — @34 00
Clipper Gap Car Wheel	— — @35 00
Refined Bar	— @ 4
Horse Shoes, keg	— @ 5 50
Nail Rod	— @ 7½
Norway, according to thickness	6½@ 70
STEEL.—	
English Cast, lb	13 @ 15
Black Diamond, ordinary sizes	13 @ 16
Drill	15 @ 16
Flat Bar	16 @ 18
COPPER.—	
Ingot	— @ 22
Sheet	— @ 20
Sheating, Tinned 14x18	— @ 31
Nails	— @ 17
Bolts	— @ 33
Old	— @ —
Bar	— @ 22
Cement, 100 fine	— @ 15½
LEAD.—	
Pig	— @ 5
Bar	— @ 6
Pipe	— @ 8
Sheet	— @ 9
Shot, discount 10% on 500 Bags	
Drop, per bag	— @ 2 10
Buck, "	— @ 2 30
Chilled "	— @ 2 50
TIN PLATES.—	
10x14 I C Charcoal	7 00 @ 8 00
10x14 I C Coke	6 25 @ 6 50
Banca Tin	— @22 50
Australian	— @23 50
I. C. Charcoal Roofing 14x20	— @ 6 90
ZINC.—	
By the Cask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @ 10
NAILS.—	
Assorted Sizes	4 00 @ 4 15
QUICKSILVER.—	
By the flask	@36½ 36½
Flasks, new	— — @ 1 25
Flasks, old	— — @ 1 05

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Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

San Francisco, March, 10, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, dividend No. 61, of Fifty cents (50c) per share, was declared payable on Wednesday, March 15, 1882. Transfer books closed on Saturday, March 11, 1882, at 3 o'clock P. M.

WM. WILLIS, Sec'y.

Office—Room No. 29, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company

San Francisco, March 2, 1882.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 39, of seventy-five cents (75c) per share was declared, payable on Monday, March 13 1882, at the office in this city, or at the Farmers' Loan and Trust Company, in New York.

WM. WILLIS, Secretary.

Office, room No. 29 Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company,

San Francisco, March 7, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 27), of Twenty-five Cents (25c) per share was declared, payable Wednesday, March 15th, 1882, at the office of the Company, room 19, No. 328 Montgomery Street, San Francisco, Cal. Transfer books will be closed on March 11, 1882, at 1 P. M. JOSEPH NASH, Sec'y.

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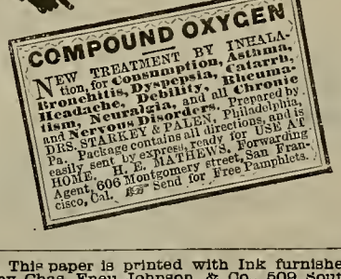
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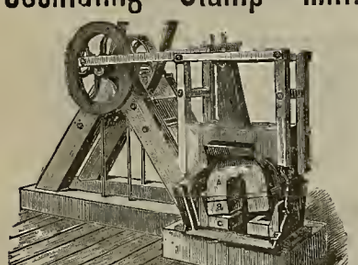

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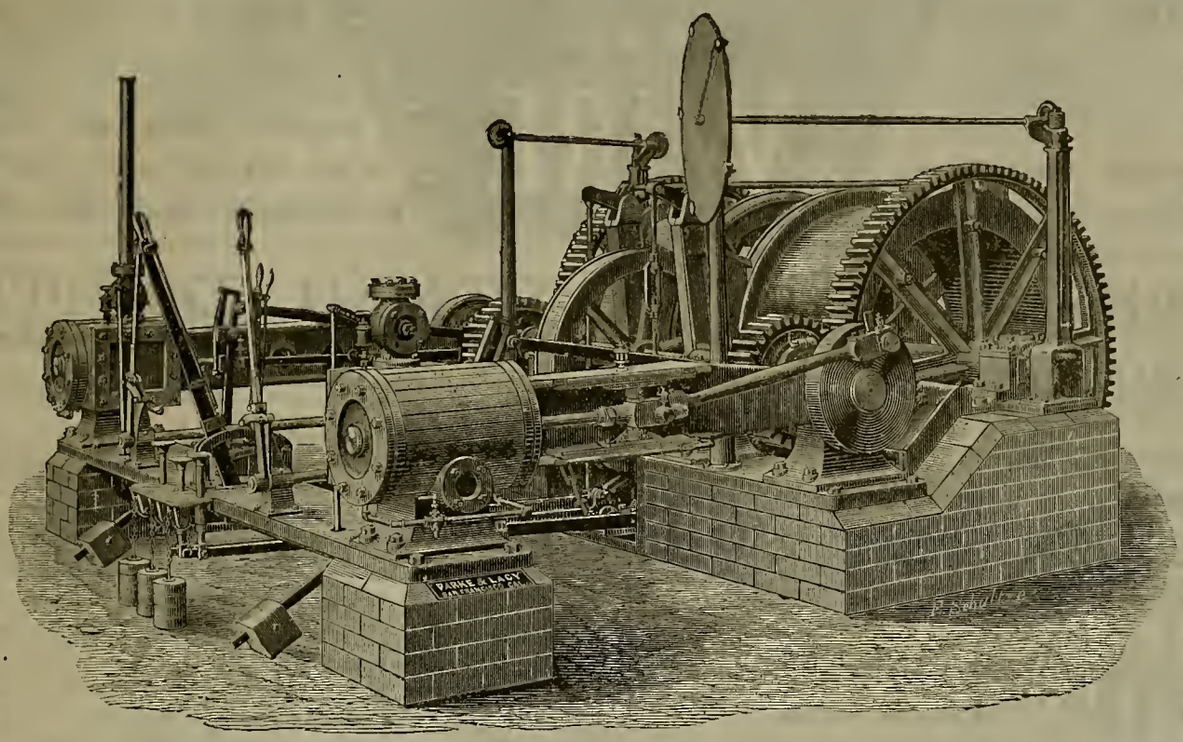

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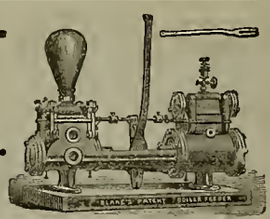

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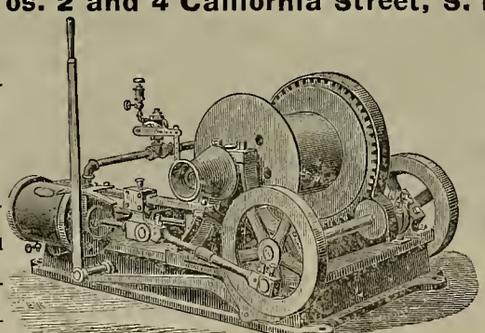

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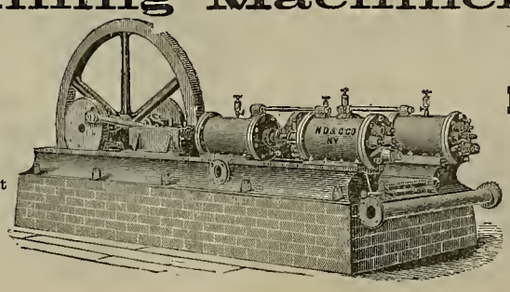

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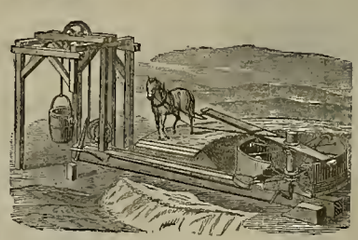

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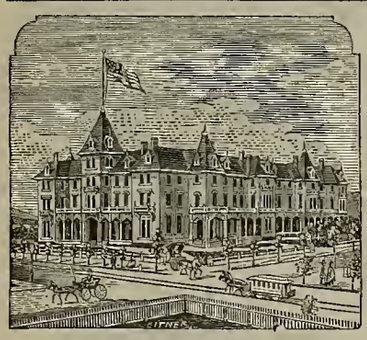

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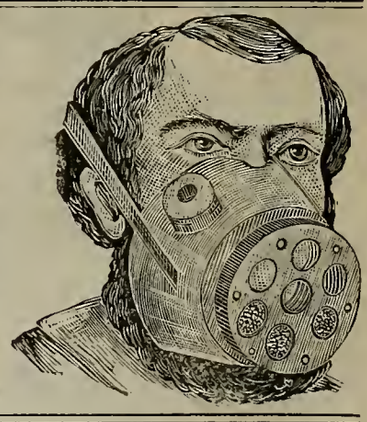

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MARCH 18, 1882.

VOLUME XLIV Number 11.

Waste of Sulphur in Precipitating Silver.

The quantity of sulphur required for the precipitation of silver is really only as 16 to 108, but a great waste occurs in the process from two causes. These are given by C. H. Aaron, in his treatise on the "Leaching of Gold and Silver Ores." Firstly, there is always a certain quantity of base metal dissolved with the silver, which also takes its portion of sulphur from the calcium sulphide; secondly, a large proportion of the sulphur is thrown down in a free state, and, in the usual course of procedure, is totally wasted by being burned off in the roasting of the precipitate.

The reason for this precipitation of free sulphur is, that the precipitant is necessarily a pentasulphide, for the calcium mono-sulphide is insoluble, and the bisulphide is only soluble with heat (*vide Regnault*), so that for our purpose we are restricted to the pentasulphide. But in the precipitation only one-fifth part of the sulphur of the pentasulphide can enter into combination with the silver, forming silver sulphide, and as the calcium combines with the oxygen and hyposulphurous acid, which were combined with the silver, the remaining four-fifths of the sulphur are unoccupied and useless.

Base metals, when present in the solution, act similarly, combining with only a portion of the sulphur of the pentasulphide, only arsenic and antimony forming pentasulphides. Gold forms tersulphide, but its quantity is usually insignificant in the lixivium.

There are two methods by which the free sulphur may be recovered from the precipitate. The first was introduced by Ottokar Hoffman, it is believed, which consists in subjecting the mass to heat in a retort, and condensing the sublimed sulphur. The second, original with Mr. Aaron, is as follows: The unwashed precipitate is placed in a vat with water, boiled by means of a jet of steam, and slacked lime carefully added. The free sulphur combines with the lime, producing at once on the precipitating solution of calcium polysulphide, and much more quickly than when the first sulphur is used. The boiling can be done in a filter vat, and when finished the clear solution can be drawn off. The precipitate is washed by running hot water through it, dried and roasted as usual. Three fourths or more of the sulphur is thus recovered for use.

THE Lake Valley (Sierras) Company, New Mexico, has 250 carloads of machinery, supplies, etc., on the way to the mines from California, including the best $80,000 mill, smelters and water-power. The company will bring water three miles, and probably have 500 men at work at an early day. The Colorado Smelting Company, with Governor Tabor at the head, will soon have a 60 ton concentrator there.

A CONTRACT has been let for the delivery of 6,000 tons of ore from the Morning Star mine during the months of March, April and May. This mine has paid five dividends, amounting to $365,000, and had a value of $50,000 worth of ore in the hands of the smelters at the close of February.

Arctic Geography.

The events connected with the cruise of the *Jeannette* have, within the past year or two, attracted more attention to the question of Arctic research than ever before. In this country, particularly, greater interest has been manifested in the geographical problems sought to be solved than was supposed would be the case. While the unfortunate ending of the *Jeannette* expedition has caused many to think that such expeditions are useless, yet all feel an interest in Arctic matters not formerly so noticeable.

The cruise of the revenue cutter *Corwin*, Capt. C. L. Hooper, in the Arctic ocean, to which we have before referred in these columns, developed some facts of more than passing moment. From Capt. Hooper's report we take the following description of Herald island, with a sketch by Dr. I. C. Rosse, surgeon of the *Corwin:*

HERALD ISLAND, IN THE ARCTIC OCEAN.

On the morning of the 20th our reckoning placed us to the northward and eastward of Herald island. We stood in to the ice, and, after following its edge to the southward for a few miles, made the land through a break in the fog, bearing northwest (magnetic), distant about ten miles. We hauled up for it and entered the ice, which was quite open on the edge, and steamed in about six miles, where we were stopped by a solid barrier of unbroken ice extending nearly north and south, and from 12 to 40 ft. in hight.

After examining the island (which was only three or four miles distant) very carefully with the glass, and assuring ourselves of the impossibility of there being any human inhabitants, we worked our way back to clear water.

The sides of this island are perpendicular cliffs 800 ft. high, and its top, which was then covered with clouds, is said to be about 1,400 ft. in hight. Capt. Kellett, R. N., who discovered it, and who succeeded in getting a foothold on a projecting rock, says:

"The island on which I landed is 4½ miles in extent, east and west, and about 2½ miles north and south, in the shape of a triangle, the western end being its apex. It is almost inaccessible on all sides, and a solid mass of granite. * * * The extent we had to walk over was not more than 30 ft."

The icy barrier which we found surrounding the island had the appearance of being unbroken, and I am convinced that it was not of a recent formation. I have questioned the whalers closely in regard to it, and find that none of them went west of Herald island last year. I am of the opinion that the ice did not leave it, and that it is no unusual occurrence for the ice to remain two and even three years without leaving the island free. I believe, moreover, that the ice rarely breaks up between Herald island and Wrangel's sound.

After getting clear of the ice we steered to the southeast, and in the afternoon fell in with and boarded the bark *Fleetwing*, of New Bedford, working up toward the island.

While cruising in this vicinity we hauled the dredge several times; but, as on previous occasions, found the bottom very barren of life, a few minute radiates and mollusks and some pieces of broken shells being the only things brought up. The bottom consisted of blue mud or pebbles, and particles of broken shells, according to location. The soundings were found to agree very closely with those given on the chart.

While in the vicinity of Herald island, a small land bird resembling a snipe flew on board. It was caught and caged, but died in a few hours, and was put into alcohol for the Smithsonian Institution.

The Dust of Cities.

At a meeting of the San Francisco Microscopical Society this week, Mr. H. G. Hanks, State Mineralogist, read the following paper:

In passing through Montgomery avenue, on my way home, I have often noticed quantities of dusty matter drifted into winrowe by the wind. In boisterous afternoons it is blown about, changing its position continuously. In rainy days it assumes the form of a dark-colored mud. Thinking it might contain the organic germs claimed by Tyndall to be inherent in dust, and particularly so in the dust of cities, I had the curiosity to collect a portion, which I submitted to chemical and microscopical examination with the following result:

Placed on the stage of the microscope under a low power, as taken from the street, it presents a disgusting appearance. The most noticeable constituents, as observed, were vegetable fiber, principally horse manure, and the decaying debris of Oregon pine and redwood planking, mixed with bits of coke and coal, broken glass, horse hair, quart sand, some blue particles, the nature of which could not be determined, and a dark-colored, finely-divided, half-dried mud, which was neither pleasant to the sense of sight or smell.

Burned in a platinum crucible the thoroughly mixed mass gave off a little water, a pale yellow flame and a disagreeable odor. On continuing the heat to incineration there remained in the crucible a ferruginous red-colored ash. The loss was 26% which was mostly organic matter, the sample having been previously dried in a steam bath. The ash was boiled in hydrochloric acid, which dissolved much iron. The gray residue was examined under the microscope with a two-thirds objective, and was found to consist almost wholly of angular quartz fragments, the result, probably, of crushed quartz sand.

A portion of the original substance was then treated with distilled water, which was previously boiled to destroy any organic forms that might be contained in it. Immediately on the water cooling, it was poured over the dust in a clean bottle, which was set aside for microscopic examination. The solution, or rather muddy mixture, was inexpressibly filthy and vile, but on examination microscopically, no living forms were observed. In six hours it was again examined and found to be alive with monads; in twenty-four hours, and again in forty-eight hours, a high power showed the liquid to be teeming with living forms, both animal and vegetable, being an interesting study to the microscopist. I noticed one animalcule in particular which I did not find figured in the books, and which I have never observed before. It somewhat resembles the vibriones, but it is more sluggish in its movements. When highly magnified it resembles an earth worm. It moves very slowly, without turning, and I could not decide at which end the head was, as it moved with equal facility in either direction. Great numbers of these forms could be seen in the field of the instrument at the same time, swimming with slow motion from side to side.

It is not pleasant to think that great quantities of this vile substance—useful only as a fertilizer—lie in our principal streets, and that it is blown about to be inhaled by ourselves and children. It finds its way into our houses, and when the carpet is swept or our clothes cleaned it rises in dusty particles to fill our lungs, and perhaps to deposit the germs of obscure diseases. It gets into the tanks on the house-tops, and we drink it in our tea and eat it in our food. May it not be that certain diseases which are charged to sewer gas have their origin in this cause?

EFFORTS are being made to open up the Yaqui country, Sonora, in which some big strikes have been recently made. Trouble is feared from the Indians.

ARRANGEMENTS have been made to have two or three hundred tons of ore from the Live Yankee mine, at Spring City, Nev., worked at the Bullion of Paradise mill.

THE bullion shipments through Wells, Fargo & Co.'s office in Nevada City last month amounted to $60,875.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

San Bernardino Mines.

Editors Press:—The Mining and Scientific Press still comes along to an old quartz miner, though I have not worked my mine as usual this season, hut took a flying trip to the mines of San Bernardino county, to Calico mountain. They are ahout 80 miles eaeterly from Colton, S. P. R. R., and 8 miles heyond the seoond crossing of the Mchave river, 20 miles up said river from old Camp Cady. The mountain lies on the same range as the Waterman mine. Some of the mines are in high grade ore, with chloride milling rock. There are about 100 people in the small town, which is on a little mesa betwcen the two gulchee or washes. There are spots or stringers of galena of no material value and worth only from $2 to $5 per ton.

The best locations are within a mile or two of the town, the Moecow and Oriental No. 1 and No. 2, the Mark Twain, Little Waterman and Nellie Gray. These mines may come out, but the wood question is undoubtedly chief. There is no water in the Mohave river, except for steam, it is so low down. Scattering cottonwood groves may be seen along the river, hut they will not last long if two 10-stamp mills are to he rnn. Most of the people there are not miners, but ranchmen. The Mohave river hills, for 50 miles above here, contain gold, silver snd copper deposits that will eventually he utilized when the California Southern is finished and a more intelligent and practicsl class of miners go there to operate, and do not ask so much as to drive off all men who have money and hrains. Then, evidently, other classee will rule.

There is one 10-stamp eilver mill running near the Calico mines with success. Forty miles up is the Los Angeles company, having a 10-stamp water-power gold mill, and employing Chinese miners. A brother of Governor Blaisdell is chief owner. The ores are pretty good. The country is alive with proepectors, who go out on the desert waetes aud sand plains to prospect, with huggies and huck-hoards and two-horse wagons to haul grub and water. In snmmer it is extremely hot and dangerons with abundance of water; and in winter it puts you in mind of the upper Missouri river and hleak plains.

There is but little wood to cook with, though the dry grease wood grows everywhere, and has to serve as firewood. The Indians are civil, but there ie no game here. It is a mineral country everywhere from the Colorado river to the Cajon pase. The are many valuable mines, no douht, heside the horate of lime and borax under the surface or the sinks and flats, chiefly cotton ball variety. I heard of some valuable lead or galena mines in my rambles from Sen Bernardino. The Mohave is no river except in winter floods. Not much of the land is adaptable to farming.

The sands hlow over what little good land there ie if the freshets do not cover it with sand. The climate has unpleasant extremes. The coarse graee is brittle and stiff in the marshes. Nothing can live on theee plains without hauling gruh, except land turtles or lizerds or an occasional jeck-rabhit. It is said that Calico will open up eome valuable mines, and they will go deep, Some of the ore has worked as high as $400 per ton, in Sen Franciaoo, by the carload. Yours,

S. D. Blade.

Snmner, Kern Co., Cal.

Damascus Steel.—Perheps one of the best methode which has ever been discovered for tempering eteel, resulting in hardness, toughness, and elasticity combined is that followed in hardening the blades of the famous Damascus sworde. The frnace in which the hlades were heated was conetructed with a horizontal slit by which a current of cold air from the outside entered. This slit wae always placed on the north side of the furnace, and was provided on the outside with a flat funnel-ehaped attachment hy which the wind was concentrated and condncted into the slit. The operation of tempering the blades wae only performed on those days of winter when a cold strong north wind prevailed. The sword-blade when bright red hot was lifted out of the fire and kept in front of thie slit and by this means was gradually cooled in the draft of air. It acquired the proper degree of temper at the single operation.

Bitter Root, Montana.—A correspondent of the Butte *Miner* says: Butte ie supposed to he the finest mining cemp in the United States, but ths Bitter Root mines will, inside of two yeare, he the richest of any mines in Montana, and even more. It must he remembered that only ten months ago the hoom started here, and, furthermore, we have the best timhered and watered country in the world. Wood is plenty anywhere within a quarter of a mile of any of the minee, and water the same and plenty of it. All kinds of building timber are plenty. Lumber is cheap—from $8 to $12 per 1,000 ft. There wae a large emigration here last year, which will be twenty times greater this year.

Salt Furnaces.

The salt manufacture and salt interest in Kanawha and Mason counties, and of West Virginia, have been written up by Dr. J. P. Hale, Charleston, in a pamphlet on the resources of West Virginia. In his article, which we have read with pleasure and profit, is an interesting account of the digging of the first salt well. And there ie also a description of the methods of transportation of, and those of manufacturing the salt. From what he says about the salt furnaces we take the following:

After the introduction of steam power, end the use of coal for fuel, no striking change was effected in the procees of salt maufacture for a number of years. What improvemente were made, were simply in degree. Wells were bored deeper, the holes were bored larger, the tubing wes better, the pumps and rigging simpler. The furnaces were larger, better constructed, and more effectively operated, the quality of the salt improved and the quantity increased, hut still they were kettle furnaces of the original type.

The mammoth of the kettle era was that of Joseph Friend & Son, at the mouth of Campbell's creek, on which they made 100,000 hushels of salt per annum. The usual capacity of other furneces was 25,000 to 50,000 hushels per annum.

This was about the condition of the salt manufacture in 1835, when there were, all told, about 40 furnaces, producing annually about 2,000,000 buehels of salt.

During this year Geo. H. Patrick, Esq., of Onondaiga, New York, introduced a patent steam furnace.

The furnace proper, after it was developed and improved, consisted of cast-iron pans, or hottoms, 8 to 10 ft. hy 3 ft. Eight or ten of these pieces were holted together hy iron screws, forming one section 24 to 30 ft. long, hy 8 or 10 ft. wide. There were 2, 3, or 4 of theee eections, according to the size of the furnace. Over each of the sections was constructed a wooden steam chest, holted to the flanges on the sides of the pans, and otherwise held togcther by wooden clamps and keys, and iron holts and rods, all made steam and water-tight by calking. These several sections are set longitudinally on the furnace wells to form one continuous furnace.

After the furnace comes a eeries of wooden vats or cieterns, a usual size for which ie ahout 10 ft. wide and 100 ft. long. The number of these cisterns varies according to the size of the furnace. They are conetructed of popla plank, 4 to 5 inches thick, dressed to joints, and fitted in a frame of oak hy sills and clamps. They are tightened hy driving wooden keys, and then calked to make them water-tight. Thie system of clamping and keying cisterns was introduced here from a model brought hy Col. B. H. Smith, from the navy yard at Norfolk. It was very simple and effective, and has been retained to thie day, without improvement or change.

There are two sets of these cisterns; the first in which the brines, after hoiling in the furnece proper, are settled, and at the same time strengthened up to saturation; the latter, in which the salt is graduated from the clear ssturated hrines. These settling and graining cisterns are very much alike, except that the grainers are but 15 to 18 inchee deep, while the settlers may he double tbat or more. Through each and all of these cisterns from end to end are three rows of copper pipes, usually 5 inches in diameter.

After the ealt water is hoiled in the furnace proper, it runs into these settling cisterne, and after being thoroughly settled and saturated, is drawn into the grainers, where the salt is deposited, and once in 24 bours is lifted out hy long-handled shovels, on to a salt hoard, suspended above the grainer, and from which, after proper draining, it is wheeled in wheelharrows to a ealt house, where it is packed in barrele ready for shipmeut. The steam geuerated by the hoiling in the furnace proper is carried from the steam chest, hy wooden pipes, to the copper pipes and through the settlers and grainers. This steam giving up its heat in passing throngh these cisterne, keeps up the temperature of the hrinee, and causes rapid evaporation. The temperature of these cieterns varies from 120° to 190°; an average would probably be 165°. This, in short, ie a description of the steam furnece, after it was improved, and the first mistakes and crudities eliminated. In the first experiments only very elight heat was imparted by the steam to the brinee, and only very coarse or alum-ealt made. It was very simple, accomplished all that was expected, and so soon as it was fairly teeted, improved up to its working condition, and its advantages demonstrated, the daye of kettle furnaces were numbered.

Andrew Donnally and Isaac Noyes were the firet to try and adopt the plan. Then followed John D. Lewie, Lewis Ruffner, Frederick Brooks, and others, till all had mede the change; and when the Ohio river furnaces were built, the system was fully adopted there.

It is now about 40 yeare eince George Patrick introduced the eteam furnace, but it still holds ite position securely, and without a rival.

Minor improvements have heen made and the furnacee much enlarged, but the general plan has not been ohanged. From the 2,000 or 3,000 or 4,000 buehels per month of the earlier furnaces, the production has been increased to 20,000, 30,000 or 40,000 bnshels per month. The writer'e furnace, Snow Hill, has made in one year, independent of all stoppages, delaye etc., 420,000 bushels, the largest single month's run being 41,000 bnshels. This furnace has 20,000 equere ft. of evaporating cistern surface, and over 1,300 square ft. of metal-pan furnace surface. About 1,200 bushels of coal per day are consumed in the furnace proper, and ahout 300 more for engines, houses, and other purposes.

In the earlier times of salt making here, various substances were experimented with for the purpose of settling or eepsrating the impurities from the hrine: Blood, glue, jelly, lime, alum, etc., were used. Something of the sort was necessary when the brine was hoiled down in kettlee with all its impurities, hut they are all useless, and worse than useless, in the preeent process, and have long been ahandoned. Plenty of eettle-room and plenty of time are all that are needed to have the brines as clear as spring water. The bitterns, after the salt is granulated, are thrown away, or used for other purposes.

It has long heen known that a small portion of some greasy or oily substance on the surface of the hrine helped "to cut the grain" and hasten the granulation. Butter, tallow, lard, rosin, oils, etc., have heen tried. Of these, hutter is far the best, and next to butter, tallow; lard and some of the others are positively detrimental.

What the action of hutter is, whether chemical or mechanical, or both, I thiuk has never been determined, hut certain it is that a very small quentity of hntter on the surface of hrine while it ie granulsting very much improves the salt, making the grain finer and more uniform.

Heat, too, is an important condition in making fine salt. The higher the temperature, other things heing equal, the finer the salt. In making the finer grades of table and dairy salt, it is necessary to have the hrine up to, or near, the hoiling point.

On the other hand, the coarser grades of salt, preferrred for meat packing and other purposes, are mede at temperatures of from 100 to 150 F.

A still coarser grained, or larger crystaled, selt, known as alum salt or solar ealt, and made in the open air hy solar evaporation, is not made here, hut there is no reason why it should not be to great advantage, as we have long summers and warmer suns than at Onondaigo, New York, where it is very largely made, and with more profit than other grades of salt.

The cost of msnufacturing ealt on Kenewha varies, of course, from time to time, with the varying price of living, lahor and supplies. It also varies with each particular furnace according to eize, and the greater or less advantages which it possesses. The larger the furnace, other things heing equal, the cheaper it will make salt. The general superintendence and management of a large furnace, costs very little, if any more than for a small one; and a given quantity of coal will make more salt on a lerge furnace than a small one.

The hest furnace will make 100 hushels of salt with 80 to 90 hushels of coal. A good average result is a huehel of salt for a hushel of coal, and the least economical consume ahout 125 hushels of coal per 100 hushele of salt.

Some of the furnaces mine their own coal, and some huy fine or nut coal from mines that are shipping coal. Even the hest furneces do not use coal at all economically or to the hest advantage. There ie, in this respect, great room for improvement.

The coet of coal delivered at the furnaces, ranges from 2¾ to 4 cents per hushel. The present cost of barrels is 25 to 28 cents for the smaller size and 28 to 32 cents for the larger. The cost of common day labor is $1 to $1.25 per day. Coal miners get 2 cents per hushel.

The cost of producing salt at these figuree may he stated at 8 to 11 cents per hushel in hulk, or 13 to 16 cents in barrele, ready for shipment.

The present cost of horing a salt well here, say 1,000 ft., after engine, well frame, etc., are ready, is $1,200 to $1,500. The time necessary to hore and ream it complete, is 60 to 90 days. The cost of a salt furnace complete, depends upon size, etc., and variee within wide limits. It may he stated roughly at $40,000 to $100,000.

Prospecting for Water.

The Uses for which the Diamond Drill is Adapted.

The diamond drill is now one of the best and most useful toole used in our mines. All Pacific coasters will remember the howl that was raised when the diamond drill wee first taken iuto the lower levels of the Comstock. Indeed, such a row was kicked up ahout it, that the drill was secretly taken into minee and was run on the sly. In thoee days the miners themselvee (for reasons of their own) were not very friendly to the diamond drill. It was then thought to he a great thing for nse in finding out ore hodies; hut it was not long before not a few discovered to their cost that for such use the drill was very unreliable.

The great use of the diamond drill, says the Virginia *Enterprise*, is now acknowledged to be not in hunting for ore, but in guarding against water. When the drill has heen rnn ahead and the ground to he passed through probed for a dietance of 150 to 250 ft., the miners feel perfectly eafe in banging right along on a drift.

In most of our leading mines, euch great depth has been attained that it is very dangeroue to pueh into unexplored ground with a drift. Bodies of water are liable to be reached that etand under such pressure that the whole face of a drift may he forced in and a torrent of scalding water poured out. In the event of suoh an accident occurring, the men could only rnn for their lives to the nearest shaft or winze. In not a few situations, loss of life would be almost inevitable. Suppose, for instance, that the men drifting on the 2700 level of the Ophir or Mexican shonld tap a flood of water, what would become of the men at the bottom of the winze on the 2900 level? The men out on the 2900 level would he scalded to death—cooked by the hot water and the steam—almost as soon as the flood hegan to tumble down into the winze.

But for the fact thet they know that the ground into which drifts and crosscuts are heing thundered with huge blasts of Giant powder have heen thoroughly probed with the diamond drill, there are many places in all our mines into which it would he almost impossihle to indnce minere to go. When a man has descended a winze 200 or 300 ft., then has moved out in a drift from the hottom of said winze 500 to 700 ft., it is not pleasant for him to think that, by a blunder made on a level ahove, a small river of scalding water may suddenly he seen pouring down and cutting off his only means of escape.

It would he impossible to get along in our mines at the present denth without the diamond drill, as all mining men know. Miners know this as well as do euperintendente, and feel just as friendly toward the diamond drill, once such a bughear, and by so many conceidered a swindling tool invented hy either Jim Fair or the devil.

Women's Shoes.—Take the most recent fashion of shoes. The heel of the hnman heing projecte outward, or rather hackward, and gives steadinees to "the sure and certain step of man." But fashion has decided that the heel of the hoot or shoe shall get as near the center of the instep as possihle. Instead of the weight resting upon an arch, in the modern fine ledy it rests upon pegs with the toes in front which have to prevent the hody from toppling forward. Then the heel is eo high that the foot rests upon the peg and the toes; and the gait is ahout as elegant ae if the lady were practicing walking npon etilts. In order to poise the body on these two points a bend forward is necessitated, which is regarded as the correct attitude of the "form divine." It is needless to say that there are few ankles which can stand this strain without yielding; and it is quite common to see young ladiee walking along with their ankles twisting all ways, or perhaps with the sole of their shoe or boot escaping from under the foot and the side of the heel in contaot with the ground. With such modern improvements on sandals (which allow the feet perfect freedom and play) the present msdemoiselle, when she attempts to run, ie a spectacle at which the gods—well, not quite that, hut at which her mother might well weep.—*Good Words.*

Important Mining Decision.—Tbe important mining decieion rendered by Justice Miller in the Circuit Court of Colorado, which was recently referred to as having nearly reached the point of finel review hy the United States Supreme Court, is to the effect that no mineral land patent can legally issue for more than 160 acres, and that if a nnmber of original locations have heen consolidated into one claim, each of the locations must be treated as a distinct claim, and advertised and proved up with proof of separato work upon it. This decieion, if sustained by the Supreme Court, would, it is said, destroy two-thirds of the patents heretofore iseued for mining claims, and make the procuring of patents for most of the old claims impossihle, hecause of the impracticahility of making proof of old locations, snd because in most instances eeparate work hae not been done on the old locations, which have been consolidated into larger cleims. Thus a shaft sunk on a consolidated claim has heen held to he work done in every part of it, but the Circuit Court judgment overthrows that principle. The appealed case hae been twice argned in the Supreme Conrt, and its forthcoming decision is awaited with great interest.

Discovery of a Nickel Mine.—A. J. Malthy, of White River, claims to have discovered a nickel mine. Ho etates that the croppings show a good percentage of the metal, hut ae yet he has taken no eteps to determine the extent or value of the find. This metal has very usefnl qualities and would be valuable if found in larger quantities, but the scanty eupply has restricted its use and the demand for it ie limited, through thie cause alone. It occupies no prominent place as an article of commerce, and we do not know that it has any fixed velue like other metals. A mine of it is worked in Lancaster county, Pennsylvania, which furnishes the Government with what is used in the coinage.—*Kern County Californian.*

More Valuable Than Eastern Papers.—The Mining and Scientific Press should find a place in every miner'e home. It conteins much practical home imformation and as a matter of fact is far more interesting and valuable to Pacific coast people than any Eastern pnblication. Dewey & Co. of S. F., are doing mnch toward the development of our varioue resources throngh their untiring efforts.—*Georgetown (El Dorado county) Gazette.*

A new hydraulic ship has heen tried in Germany, and succeeded in making nine knots an hour. She is driven by forcing water ont of tubes with narrow outlets placed in the stern.

MECHANICAL PROGRESS.

Solidity in Machinery.

The treatment of iron in machinos has, for many yeare, heen too mnch like its use for toys and ornaments, a pretense of lightness in imitation of other material. The eaving in the first cnst of oastings, and in the price of wrought iron has hecn a large, if not a principal element in the prodnction of all machincry prodncts of iron. Lightness of material and airy elegance of form have heen frequently qnoted as evidences of superiority. Lote of this sham trash have fonnd their deserved way to the scrap heap snd the foundry cupola, hut muoh more remains tn he relegated to the same deetination.

The trifling with the capahilities of cast iron seen in common architectural ornaments and lawn and cemetery fences can he horne, as it is merely an offence to common sense and good taete; hut the tricks shown hy economic builders nf machinery, especially machine tools, are reprehensihle.

I know of an inetanoe where a maker of nrdinary household pumps, of cast iron, deliberately threw aside an entire set of patterne, hecauee hy a new eet (costing more) he could save 20 cents on the cost of weight of castings for each pump. He probably lost on the price of the new patterns, on the haulks in the foundry hy thinnor patterns, on the after work oy having harder iron, and on the additional grnmhle by purchasers of the "improved" pump, which they returned hroken, a mnch larger amount than the supposed cheapening of the pnmp hy the saving of iron. And yet thie lightening the weight and decreasing the cost of the iron castinge is to-day a considered element in machine huilding; and the manufacturer who csn show the lightest csstings—other requirements heing eqnal—is the one who helieves himself to have arrived the nearest to mechanical perfection. These irnn savers seem to imagine that iron ranks among the preoious metale, and ie valned solely by its weight, and hardly hy its uefulness. Or, they seeume to he æsthetic in ite use, and desire to he recognized hy their artistic taste in forming it.

All this is nonsense. Iron is not adapted to worke of art, the cast iron ststnes of modern times and the wonderfnl forgings of mediæval times to the contrary notwithstanding. There have heen surprising achievemente in the fashioning of iron hy hand, and remarkahle results from the molten metal; hut none of them prove the proper spplication of the metal to be that of furnishing tasteful forms or artistic products.

In the mechanic arts iron is a resistsnt. It occnpies in mechanics a place eimilar to that of grsnite in architecture; it is to resiet, and bear, and suetain, and hold. In fact it is shown at its best in the anvil, and this idea should be the prevalent one in the building of macbines, especially those that are worked hy reciprocating motion. It is of lese importance that rotary working machines should he unusually stiff, as the strain is mostly continuous.

Bnt the planer and the header (of rivets and screws) test the capacity of iron. Think of a planer platen with a load of five tons or more—in many cases double that amount—moving in one horizontal direction at the rate of 20 ft. per minute, brought to a sudden etop, and started on a reverse, or return, speed of 30 ft. per minnte; what sort of material, but iron, could stand snch shocke, repeated over and over, day by day, for yeare? And yet one may etand by the heade of planere and with the finger feel the "give" as the chip "takee," and as for the shock of the retnrn, the entire floor responds to it.

It is quite evident that exact work is impossible under euch circumstances. One fault with many of onr planere is that the nprights and the crose-har are not etrong enough; they have not iron enough; they give to every chip-take. So little is thie matter considered that in one shop recently visited one planer had its uprights of solid weh and gradually curved in a oonvex radiue from the top to the hed, while one other, of the same size, had a weh with three great holes in it and the hackward curve made into a section of an ogee molding. Yet both of theee planers were used for similar work.

It ie difficult to make tests of the failure of weak machine tools in operation, owing to the general tremuloneeee of the shop; but the writer has heen aceured, by one who hae tried to aecertain the differences in machines in actual work, that he has made eatisfactory experiments to the effect that the upper part of the uprights of a 40-inch planer "winked" three-sixteenthe of an inch on taking the chip. Possibly part of thie was due to insecure foundation, ae the the planere tested were on a second, or supported etory.

But there is another lack of solidity in the burden-bearing quality of machine tools. It may be a matter of doubt if the beds of planers loaded with a job are usually level, or etraight. If eome recent diecoveries made hy a prominent machine tool builder are true, tbe really level planer bed is the exception. Failing in getting good resulte from his heaviest planer, which freqnently planed a load of nearly six tons, he instituted experiments that indnced bim to build a pier of masonry under the center of his big planer, from the hard pan of the cellar, and mount on it two jack-screws, one nnder each planer "way," to keep the plsner from sagging while at work. He stated that the sag in the length of 10 ft. wae "more than one-eighth of an inch." It ie eoarcely to be doubted that this experience could he duplioated in many shops.

If such discrepancies exiet in general shops, similar ones may he possihle in others where tools of procision are produced. If exactness ie desirahle in mechanical work, it should hegin at the heginning. First let the tools—the machine tools—have plonty of material, and then place them on secure foundations. This present plan of hnilding storied buildings, and raising addednl additinns above the ground, mnst he given up before tools of precision can he produced with aheolute certainty. And our tool builders and machine manufacturers must cease to look upon iron as a costly material, but regard it as a convenient means to a desirahle end. —*Cor. Boston Jour. of Com.*

FRICTION MACHINERY.—The operation of friction machinery has now become a fixed fact, and its eaey adaptability where waste power can he utilizsd is a marked feature. A machine of this kind has come into use, which consists simply of an iron cylinder one foot long and one foot in diameter, having a fixed plate of hardened iron in one end, and a second plate attached to a revolving shaft, which presese lightly or closely upon the fixed plate, as circumstances require. The cylinder is filled with water, the ehsit revolves, and from the friction of the plates, the water in an incredibly ehort time is heated, and hy means of steam pipes can he carried to great distances for heating purposee. The machine is so constructed as to render it easily adapted to all places where there ie waste power, as in mills, factories, puhlic huildings, cars, etc. The power required for its operation is very slight; thus, to carry a machine with thirty-six equare inches of friction plates—the ordinary size—one horse power only is reqnired, while a machine with two hundred and twenty-five square inches of friction surface will require at most but six horse power.

EFFECTS OF COLD ON STEEL.—Observations made eome time eince on Russian railways ehow the effects of cold on steel. From figures pnhlished it ie learned that from Oct. 1, 1879, to March 31, 1880, 480 fractures of tires (18.9%) occurred while the temperature wae ahove zero, 105 frsctures, or 4.1%, at zero, and 1,952 fractnree, or 77%, at temperatures helow zero. The greatest nnmher of fractures happened on Dec. 9th, 10th, 17th and 23d, 1879. The ahove interesting data prove that the frequency of fractures during the period etated must be attrihuted to its ahnormal atmospheric conditions. Of the fractures recorded, 3,269 occurred in ingot steel tires (crucible, Bessemer, Martin and manganese steel) and 1,045 in tires of puddled steel or wrought iron. Tires of fine-grained iron and puddled steel appear to he safer, while ingot steel offers greater advantages ae to wearing. The thickness of tires also playe an important part in their resistance to the effects of cold, the greater nnmher of fractures occurring in thoee of smaller thicknesses.

A NEW MACHINE WANTED.—A Louieiana sugar planter writes to the *American Manufacturer* that there is great need in the South for a machine that will crush or grind unshncked ears of corn, as they come from the field, into a coarse meal of corn, cob and husks, and do it rapidly. He ie aware that there is a machine that will crush corn in the ear thoroughly, one ear at a time; what be wants is something that will receive a hushel of eare or nuhbine at once, and crush, say, 20 hushele an hour. One of the great trouhles of eugar planters, he says, is the preparation of food for their mules. To crush corn in the ear with exieting appliances, the corn has to he husked, coeting much labor, and tbere is apt to he a great loee of small ears. "A fortune awaits the inventor of a machine to crush hy the wholesale corn, cob and shucks together." The problem does not seem to he a difficult one, and eome of our inventive readers may find it profitahle to nndertake the solution.

MANUFACTURE OF CELLULOSE FROM WOOD.—Dr. Richard Mitscherlich, in Darmstadt, emploge the following process: Reducing hodies diseolved in water and acid, preferahly sulphate of lime, are heated for eome time with wood under great pressure. The wood remains a fihrous mass, while the bodies which produce its disintegration are eaeily removed. The wood fiber, of which generally more than nine-tenths of the wood ueed is ohtained, is treated after the chemical process by a mechanical process, and can afterwards be used for the manufacture of paper, raw tissues, etc. If bark, straw, flax, etc., is used instead of wood, a finer fiher ie ohtained by this process than it was formerly poesible to obtain with the eame materials.

TIN PLATE MANUFACTURE.—The term "char coal" on tin platee ie a fraud and alwaye was. None but coke irons have ever been need in the manufacture of tin plate. In fact tbe most ductile irons made in England or on the Continent of Europe are smelted with coke. This country produces brande of iron better adapted to making tin than any in the world. Our heat West Tennessee and Alahama irons are as much euperior to British brands for tin plate as they are for boiler iron or car wheels.—*Chattanooga Tradesman.*

SCIENTIFIC PROGRESS.

Electricity as a Motive Power.

The *Manufacturer and Builder* says that the development of electricity as a motive power is an aim which, though difficult of realization, is yet so strongly to he desired. Its achievement is not very far off, if we may take the utterances of some of the hest authorities on the subject as couclusive evidence of the probahilities of the future. For example, M. Bontonx, presiding recently at a meeting of the Parisian Society for the Utilization of Electric Force, observed that the artisan who needs a little motive power for his work, ie forced to seek it in the employer's factory, while thousande of workmen and workwomen wear out their hodies and destroy their strength in impelling the sewing machine, the lathe, and other motive powers of small industry. The division of electrio energy is destined to effect an entire revolution in this sphere.

The day will come, and sooner than is imagined, when the srtiean family will see enter their dwelling hy means of a magic wire, the force which is now so costly to them, and this will he the democratization of force for the benefit of the working class. The solution of the question of motive force in mechanical indnetries is, by this, apparently not far distant, and it ie curious to contemplate the changee in our social and puhlio arrangements which euch a development of tbe electric motor would accomplish. If an efficient, actuating agent for small machines of every kind could he resdily obtained and cheaply purchased, what a revolution would come over the exieting lahor market! How many work-shops for men and work-rooms for women would be closed, and quondom employeee supplied in their own homes with the means of carrying on their work in their own apartments. Without attempting to forshadow all that might happen, certain it ie that the coet of driving lathes, and machinee of every kind, would he largely diminished, and the means and motive for extending their application eupplied.

From all points of view, it ie much to be wiehed that this novel mode of actuating machinery may he developed so that its efficiency and economy may estahlieh a reputation, and be largely patronized hy hoth large and small employers of labor.

Electric Reservoirs.

In counection witb the ahove the following from a late numher of the London *Times* will also he of special interest:

Some interesting and succeseful experiments in the suhdivision of the electric current were shown on Monday afternoon to a party of gentlemen who visited the works of Mr. Rogers, of Farrington street. Mr. Rogers claime for his invention that it will enahle him to supply electricity for domestic purpoees as water and gas are now supplied; and that from a cistern or reservoir, to which the current must he conducted hy the main wire, and which may he carried to every room in a houee. The novelty of the eystem, for other methods of suhdivision exiet, lies in the ease and completeness with which the current is distrihuted over the wires, and in the fact that it is rendered almost infinitely divisible without much loss of power.

A town cannot be supplied with water hy a mere ramification of pipes, and, following the idea, the inventor of the system we are sketching, whenever he desires to suhdivide the current of any given wire, collects it in a small cistern or reeervoir, from which it ieeues again through ae many wires as it may be neceseary to attach. Thus, in lighting a large huildiug hy electricity, the main wire would convey the current to the chief cietern on the ground-floor or in the basement, wbence it would be distributed among subsidiary cisterns, of which there would he one or more on each floor of the house, and these in turn would transmit the divided current to each separate room.

The experimente made on Monday demonstrated the efficient action of the cisterns or reservoirs, on which the success of the whole eyetem depende, and ehowed that tbe current of a single pair of wiree could he made to supply an indefinite numher of lamps. Edison lamps were ueed and received the current from eix cisterns, the suhdivision heing such that it mattered not whether each cietern supplied one lamp or half a dozen. This, it must be admitted, is one method, and not an unsatisfactory one, of solving a problem that has long vexed practical electricians. An ingenious modification was aleo ehown of the apparatus known as Barker's mill for driving a dynamo-machine hy water power, with a governor so contrived as to eneure the application of an unvarying degree of force, and by consequence a perfectly even and unfluctuating electric current.

MECHANICAL EQUIVALENT OF HEAT.—It does not appear to he generally known that the value of the mechanical equivalent of heat has within a few yeare been corrected. It is generally referred to hy mechanical writers at 772 foot pounds. Dr. Joule repeated his famous experiments in 1876, nearly six years ago, with extraordinary precautions, and the mean result of 60 experiments gave 774.1 foot pounde, with a possihle error of 1-400, on account of the "thermometric scale error." This value shonld he used in all calculatione relating to the value of heat as a motive power.

Are Metals Volatile?

Quite different views are held hy chemists snd practical smelters, snd the question implies a waste or ssving of ahout 10% of all the gold and silver smelted every year, amountiog to $50,000,000, thus an actual lose to the country of $5,000,000 annually hy a needless waste, if metals are vaporous or hecome so under certain oonditions of heat or chemical reactions, as held hy Dr. Duryee.

Iron is entirely non-volatile, while the phosphorus in it ie volatile if chlorine and sufficient heat be applied.

Lead is vaporized at a red heat; zinc ahout the same. The telluride of gold ores is found to he impoesihle of smelting in ordinary cupola furnaces, hecause tellurium gives to gold the property of hecoming volatile at a red heat, while gold itself is considered non-volatile at even a white heat; but it is found chlorine has the property of combining in a gaseous state with gnld at a heat of 4,000°, rendering it so volatile that its vapors can be ssrried into a proper condenser and there condensed the same as oil vapors are condeneed.

It is found hy furnacemen that silver and lead when smelted together are carried off to the extent of 10% to 30%, even at ordinary furnace heat, and it is hecoming a serious question around Leadville how to overcome the effect of lead poieoning from the numerous furnacee.

By several analyses of Duryee's furnace slage from gold and silver oree, it was found that the metals were all vaporized down to 10 or 50 cents per ton of ore, and as it is extremely easy and simple to condense these vapors, this mode of working the precious metsls would eeem to he the surest business sagacity on the part of smelting or mining companies.

It now having been shown that all metals are vaporous, or can he made so, it is only a question of time when all the vapore will he saved. Who knows but that the distilling of metals will he as esey as distilling oile or cider! Any oxy-hydrogen hlow-pipe heat on a large scalo properly applied would seem to us feasihle and practicsl. —*Hall's Journal, December.*

ELECTRICITY FROM CRYSTALS.—It has heen sbown that, hy the mere compression of an inclined hemihedral crystal, electricity is developed. Experiments were made hy placing a crystal, or a suitahle section of it, between two sheets of tinfoil, insulated on the exterior hy platee of caoutchonc, the tinfoil being connected with a galvanometer. By compreseing the crystal into a vise or otherwiee, electricity wse developed and measured hy the galvanometer. The electricity developed is the opposite of that produced hy heating a crystal; that ie to say, the extremity of the crystal which hecomes positive on heating, hecomes negative on compression. On releasing the pressure, electricity of an opposite kind is produced. It was also found that the electricity by preseure can only he ohtained from hemihedral crystals having inclined faces. By combining a number of inclined crystals in a pile, an apparatus for producing electricity has been invented. The amount of electricity developed varies for different materials, a section of quartz, cut perpendicular to the main axis, evolving more than a similar section of tourmaline.

SELENIUM AS A HEAT REGULATOR.—The sensitiveness of eelenium to radiation ie to he made use of in regulating the heat of muffle furnacee. The concentration of rays, more or less, upon selenium, influences the electric conductivity of the material, as most people know, in a marked degree, and this property M. Germain proposes to make use of to control the heating of furnacee. A window in the furnace, made of very refractive alumina glass, permite the red glow to reach a dietant mirror; the rays are reflected upon selenium, and when the light reaches a certain stage of hrightness the electric actiou of the selenium conductor is snch that it acte on a mechanical arrangement by which the fire-hare of tbe furnace are withdrawn. The fuel of the furnace is thus allowed to fall out as eoon as the right temperature for fusing enamels hae heen reacbed. The *Photographic News* saye: If a self-acting selenium actinometer of this kind will permit the firing of enamels with certainty, pbotographers will not be slow to avail themselves of it.

PRESSURE OF GAS IN COAL.—Mr. Lindsay Wood has reprinted a paper which he read hefore tbe Newcastle Institute of Mining Engineere, "Experimeuts on the Pressure of Gas in the Solid Coal." These experiments are made with great care by boring into the solid coal to a considerable depth, fitting in a pipe, and connecting it with a preseure gauge. At Eppleton mine, at the depth of 1,261 ft. from the surface, the preesure reached was 104½ lbs. per square inch. At Boldon one experiment gave 386 lbs., and another 461 lbs. These enormous pressures sufficiently indicate the canses of many of our colliery explosione, and convincingly estahlisb the neceseity of adopting some method by which the gas may be drained from the fiery coal seame.

FINE DRILLING.—Prof. Edward C. Pickering, of Harvard College, eays tbat, in undertaking to measure the intensity of the light of the catellitee of Mare, he had occasion to need an extremely small hole. A hole about the *twenty-five-hundredth* part of an inch in diameter was finally secured.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Feb. 23.		Week Ending Mar. 2.		Week Ending Mar. 9.		Week Ending Mar. 16	
Alpha	1⅝	1.40	1.70	1	1⅛	1.10	1⅛	1.10
Alta	3.55	3.10	3.20	3	3.35	2.70	3.40	2 65
Andes	50c	45c	50c	35c	75c	45c	75c	45c
Albion	1.95	1⅞	2	1.85	2.90	1.80	3.45	2.60
Argenta	....	....	....	....	....	....	....	....
Addenda	....	....	....	....	....	....	5c	....
Belcher	70c	42c	50c	35c	60c	29c	75c	55c
Belmont	....	....	60c	40c	50c	....	50c	....
Best & Belcher	6⅞	6⅛	6⅞	5⅛	6⅝	6	6¼	6
Bullion	75c	60c	1.20	60c	95c	65c	75c	70c
Bechtel	40c	....	....	....	35c	30c	35c	....
Belle Isle	....	....	5c	....	....	....	....	....
Bodie	3¼	2.95	3.90	3	4.80	4.35	4.55	4.20
Benton	85c	70c	70c	60c	60c	50c	45c	35c
Bulwer	2⅜	2.40	2.40	....	2	1.85	1⅞	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	100	....	....	....	10c	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	10c	....	15c	10c	....	....	....	....
California	35c	10c	35c	20c	45c	30c	35c	30c
Challenge	50c	....	....	....	40c	....	....	....
Chollar	1.20	1.05	1.20	95c	1.20	1.05	1.20	1.10
Confidence	1¼	1.10	1.40	90c	1	....	1.00	1
Con Imperial	10c	....	10c	....	10c	....	10c	5c
Con Virginia	65c	45c	50c	40c	95c	75c	90c	75c
Crown Point	65c	40c	45c	35c	40c	25c	35c	20c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	70c	....	80c	75c
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	5c	....	30c	....	25c	....
Derbec	....	....	....	....	....	....	....	....
Day	85c	....	1.30	85c	1⅜	....	1⅜	1.40
E. Mt. Diablo	40c	30c	32c	....	30c	25c	25c	20c
Eureka Con	13	12½	13	12½	16½	13½	23	19
Exchequer	70c	45c	60c	35c	60c	40c	50c	40c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	2	....	....	....	40c	....	35c	....
Goodshaw	50c	40c	40c	....	40c	....	35c	....
Gould & Curry	3.45	3.15	3.35	2.85	3.25	3.05	3.30	3.10
Hale & Norcross	1.70	1⅛	1.60	1⅛	1.55	1.05	1.30	1.05
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	25c	....	20c	....	20c	....	20c	....
Justice	90c	70c	75c	70c	70c	65c	75c	55c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	....	70c	15c	....	....	....	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	15c	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1⅛	....	1⅛	....	1⅛	....	....	....
Martin White	4.45	4.05	6	....	6⅜	7⅓	....	7¼ 7
McClinton	....	....	....	....	....	....	....	....
Mono	1	90c	1.60	45c	1.45	1.35	1⅛	1¼
Mexican	9⅜	8¼	10	8⅜	9¼	8⅜	8⅜	8⅜
Mt. Diablo	7⅜	6¼	6⅜	6¼	6⅜	6¼	6	....
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	90c	20c	35c	30c	1.05	40c
New York	....	....	....	....	....	....	....	....
Northern Belle	10⅛	9¼	10¼	9¼	10	9⅜	9¼	9⅜
North Noonday	....	....	25c	....	30c	....	75c	50c
Navajo	....	....	55c	....	....	....	30c	....
Occidental	....	....	80c	....	75c	....	75c	70c
Ophir	4.80	4.10	5	3.80	4¼	3⅜	3.65	3¼
Original Keystone	....	....	....	....	....	....	....	....
Overman	80c	55c	55c	45c	55c	40c	45c	35c
Oro	25c	20c	35c	25c	40c	30c	40c	30c
Paris	....	....	....	....	....	....	....	....
Potosi	1.20	1	1.15	90c	1.10	85c	1.05	1
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.65	1.35	1⅛	1	1.40	1	1.20	1
Seg Belcher	....	....	1⅛	1	2.40	1.60	1⅜	1
Sierra Nevada	....	....	6⅞	6	6⅜	7	7¼	7
Silver Hill	5c	....	....	....	....	....	....	....
Silver King	18⅜	18	18¼	18	18¼	16⅞	18	17½
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	75c	65c	90c	65c	90c	70c	80c	65c
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	....	....	25c	20c	....	....	15c	....
Tioga Con	20c	10c	....	....	30c	25c	20c	....
Tiptop	4¼	4.10	4.20	....	....	....	5	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	10⅜	10¼	11⅛	....	9⅜	11⅜	10¼	11⅜ 10⅜
Utah	5⅜	5⅛	6¼	5	5⅜	4¼	4¼	4.35
Ward	....	....	3⅜	....	....	....	3⅜	....
Wales	55c	50c	60c	55c	55c	50c	55c	....
Yellow Jacket	1.65	1	1.85c	65c	70c	20c	1.45	1.10

Sales at S. F. Stock Exchange.

Thursday A.M., Mar. 16

50	Alpha	1.15	
80	Andes	.75c	
200	Alta	3.20	
70	B & Belcher	6⅛	
310	Belcher	60c	
20	Bullion	70c	
50	Benton	.45c	
510	Con Virginia	.90@85c	
100	Chollar	1.20	
250	Crown Point	30c	
25	Con Imperial	10c	
450	Exchequer	45c	
20	Gould & Curry	2.30	
150	Hale & Nor	1.15	
500	Justice	65c	
350	Julia	20c	
200	Mexican	8⅜	
70	Ophir	3.75	
200	Overman	35c	
630	Potosi	1.15@1.10	
170	Savage	1.15@1.20	
50	Seg Belcher	1⅛	
50	Scorpion	80c	
95	Utah	4.35@4.40	
120	Union	11¼	
550	Yellow Jacket	1.10@1.15	

AFTERNOON SESSION.

390	Albion	2.20	
100	Atlas	.50@55c	
500	Addenda	10c	
100	Boston	45c	
150	Bodie Tunnel	1.45@1⅛	
200	Bodie	4.40	
80	Bulwer	1.90	
370	Day	1.25@1.40	
100	E Mt Diablo	20c	
200	Mono	1⅛	
400	Noonday	95c	
100	Navajo	30c	
50	Pinal	2⅜	
70	Southern Nev	.61@65	
100	Wales	55c	

THE miners about Silver City have got out more ore than the little water-mills along Gold canyon can work. The mills got behind during the cold weather, when their wheels were all frozen up. Some men with small lots of ore have been waiting a month or two to get them worked. A few are now hauling their ore to the Merrimac mill on Carson river.

BIG PINE is at present somewhat despondent. The Montezuma mine has suspended operations. Various reports are in circulation as to the cause; there is one truth, the mine has "shut down." Bishop had her Poleta, Big Pine her Montezums. The result is contrary to all public expectations.

THE New York *Stock Report* says: The sum of $2,990,653,03 in gold and silver has been received in this city from the mines since January 1st.

THE hullion shipments from the Horn Silver during February amounted to 2,889,239 lbs.

NEW MEXICO bids fair to be second only to Michigan in the production of copper.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Albion Con M Co	Nevada	10	30 Mar 6	Apr 10	May 2	D B Chisholm	327 Pine st
Andes S M Co	Nevada	18	25 Feb 2	Mar 9	Mar 30	B Burris	309 Montgomery st
Belcher S M Co	Nevada	29	50 Feb 6	Mar 11	Mar 31	J Crockett	1327 Pine st
Belmont M Co	Nevada	31	15 Mar 11	Apr 17	May 15	J W Pew	310 Pine st
Belvidere M Co	California	13	25 Feb 9	Apr 12	May 1	C V D Hubbard	310 Pine st
Benton Con M Co	Nevada	7	25 Mar 10	Apr 14	May 4	Wm H Watson	302 Montgomery st
California M Co	Nevada	2	20 Jan 18	Feb 25	Mar 22	C P Gordon	309 Montgomery st
Con Pacific M Co	California	4	25 Jan 28	Mar 3	Mar 27	F E Lutz	330 Pine st
Con Virginia M Co	Nevada	17	30 Jan 31	Mar 11	Apr 8	A W Havens	309 Montgomery st
Crown Point G & S M Co	Nevada	47	25 Feb 16	Mar 23	Apr 13	J Newlands	327 Pine st
Day S M Co	Nevada	10	50 Jan 28	Mar 6	Apr 3	E M Hall	327 Pine st
Equitable T & M Co	Utah	26	10 Feb 2	Mar 9	Mar 23	C J Collins	512 Montgomery st
Fall Creek M Co	California	5	30 Feb 16	Mar 24	Apr 19	W Willis	309 Montgomery st
Gopher Con M Co	Nevada	2	50 Jan 11	Feb 20	Mar 20	H Deas	309 Montgomery st
Independence M Co	Nevada	9	15 Feb 24	Mar 31	Apr 24	E M Hall	327 Pine st
Iowa M Co	Nevada	16	03 Mar 8	Apr 15	May 6	C C Leavitt	411½ California st
Martin White M Co	Nevada	11	25 Jan 20	Mar 2	Mar 30	J J Scoville	309 Montgomery st
Mayflower Grav M Co	California	15	10 Mar 7	Apr 11	May 3	J Morizio	328 Montgomery st
McMillen M Co	Arizona	4	30 Feb 8	Mar 14	Apr 12	J Morizio	328 Montgomery st
Mexicau G M Co	Nevada	18	1 00 Mar 13	Apr 15	May 9	C L McCoy	309 Montgomery st
Modoc Con M Co	California	10	30 Feb 14	Mar 28	Apr 25	J W Pew	310 Pine st
Mono G M Co	California	16	30 Feb 7	Mar 14	Apr 3	W H Lent	309 Montgomery st
Napoleon M Co	California	2	03 Feb 18	Mar 23	Apr 8	H Smith	309 Montgomery st
New York M Co	Nevada	27	15 Jan 18	Mar 7	Mar 28	F E Dietz	327 Pine st
Ophir S M Co	Nevada	41	1 00 Mar 7	Apr 8	May 2	C L McCoy	309 Montgomery st
Pinal Con M Co	Arizona	2	30 Jan 24	Mar 7	Apr 3	W W Traylor	309 Montgomery st
San Jose M Co	Nevada	18	75 Jan 30	Mar 15	Apr 19	A Carrigan	109 Front st
Savage M Co	Nevada	50	50 Mar 7	Apr 10	May 1	E B Holmes	309 Montgomery st
Seg Belcher M Co	Nevada	21	1 00 Feb 14	Mar 20	Apr 10	G D Edwards	414 California st
Sizourney G & S M Co	California	3	03 Jan 24	Feb 28	Mar 29	A Judson	320 Sansome st
Silver Belt M Co	Arizona	1	15 Mar 8	Apr 17	May 15	J W Pew	310 Pine st
Silver Hill M Co	Nevada	17	15 Feb 2	Mar 9	Mar 29	W E Dean	309 Montgomery st
Spaulding G & S M Co	California	2	10 June 23	Feb 23	Mar 24	J W Pew	310 Pine st
Utah S M Co	Nevada	38	1 00 Mar 11	Apr 14	May 3	G C Pratt	309 Montgomery st
Yellow Jacket S M Co	Nevada	44	1 00 Feb 7	Mar 4	Apr 11	M Otey	327 Pine st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Bay State S M Co	Nevada	1	02	Dec 29	Mar 31	Apr 24	J W Pew	310 Pine st
Bed Rock M Co	Arizona	1	06	Feb 6	Mar 13	Apr 3	C H Graves	6 Post st
Cahorca M Co	Mexico	5	30	Feb 25	Mar 23	Apr 17	W L Elliott	220 Sansome st
Equator M Co			20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Golden Fleece Grav M Co	California	24	30 00	Jan 31	Mar 4	Mar 23	Fr Schirmier	785 Folsom st
Metallic M Co	——	—	20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Metallic-Equator M Co	——	—	20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Pinal Copper Co	Arizona	3	2 50	Jan 28	Mar 20	Apr 10	Geo T Shaw	340 Fourth st
San Pedro G & S M Co	California	4	03	Feb 27	Apr 3	Apr 27	W G Holmes	rm 1, Sherman's build'g

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Ingersoll Con M Co	——	Calvert Meade	324 Pine st	Annual	Mar 22
Maryland Con M Co	——	E P Farnsworth	219 Sansome st	Annual	Apr 8
Me ones Con M Co	——	J C Oughin	419 California st	Annual	Mar 28
Paris M Co	——	Wm J Taylor	310 Pine st	Annual	Mar 23

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Mar 13
Contention M Co	——	D C Bates	309 Montgomery st	25	Feb 23
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Mar 15
Silver King M Co	Arizona	J Nash	315 California st	25	Mar 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Mar 13
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10	Jan 3
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10 (extra)	Jan 3

The Mining Share Market.

A fair amount of business has been transacted during the week, but with no marked advances in prices. Upon the Comstock the water question is still prominent. The *Enterprise* says:

Although at the Gold Hill mines the "fountains of the great deep have been broken up," and the waters have "prevented exceedingly," yet Capt. Taylor, the Noah of the Yellow Jacket ark, says the dove now comes in to him with an olive leaf. In the last five days the water has risen hut 17 ft., and hut 18 inches in the last 24 hours. This shows that the water has about found its level. As five strokes per minute were required to keep the mine clear of water previous to the influx from the Exchequer, it is evident that the flow of water from that sonrce is now very light. Running at five strokes the pumps throw out 500 gallons per minute, hut hy increasing the speed to seven strokes (which is perfectly safe), and rnnning the hailing tanks, 1,500 gallons may he thrown ont every minute. From this it is evident that should a determined attack he made on the water it wonld he rapidly lowered. The present deluge is no worse than the last. That was "essnaged" in an astonishingly short time, and under many disadvantages not likely to he encountered on this occasion.

All that is reqnired is a little pluck and prompt action to rescne this grand old mine (now the deepest on the lode and the deepest in the United States) and place it where it helongs in the list of the Comstock mining properties. It is to the interest of all on the Pacific coast to do this. It will not do to desert the first mine that has attained the good rounds depth of 3,000 ft.

The Yellow Jacket company does not owe a cent. Let the present assessment he paid and it will not only pay all of the expenses of the present month, hut will leave in the treasury the ronnd sum of $100,000. This sum, with snch luck as the company have a right to expect, will drain the mine and allow of a resumption of work in the promising sections of the 2828 and 3000 levels, from which they were driven by the flood. And, let it not he forgotten, draining this mine drains all that are now water-logged—and the ark rests on Ararat.

ACCORDING to the report of Prof. Newberry, the Stewart mine, Bingham, has $5,000,000 gold ore in sight. Recent explorations make the estimate much larger, and it is thought with improved machinery this ore can he worked for $1 per ton.

RICH strikes in the districts southeast of Walker lake are continually reported. Garfield has been ahead lately.

AT Black Hills, recently, a run of 1,000 tons was made at the Grand Junction mill, the total cost of mining, milling, and placing retort in bank amounted to 80 cents per ton.

Bullion Shipments.

We qnote shipments since onr last, and shall he pleased to receive further reports:

Hanauer, March 9th, $4,250; Frisco, 11th, $5,955; Hanauer, 11th, $4,250; Leonore, 11th, $2,260; Richmond Con., 11th, $11,535; Alice, 9th, $7,000; Northern Belle, 11th, $7,350; Contention Con., 9th, $14,926; Diahlo, 7th, $6,705; Eureka Con., 2d and 5th, $19,686, Star, 3d, 1,306; Christy, 16th, $6,890; Eureka Con., 9th, $4,230; Northern Belle, 9th, $7,975; Father de Smet, 6th, $25,000; Bodie Con., 13th, $7,480; Star, 10th, $2,171; Mt. Diablo, 11th, $14,754; Contention Con., 13th, $17,256; Standard Con., 14th, $20,210; Bodie Tunnel, 14th, $2,250; Contention Con. (for Feb.), $128,000; Girard (for Feb.), $20.000; Grand Central (for Feb.), $110,000; Tombstone (for Feb.), $115,000; Vizina Con. (for Feb.), $45,000.

DEMAND FOR AMERICAN GOLD.—The European demand for American gold continues. This demand has been in operation for six weeks. It was prompted by the financial tronhles in Paris, and the consequent advance in rates for money at all the leading centers of finance. On the 2d of March the *Servia* took out $750,000 in double eagles and on the 4th the *Baltic* took ont $1,500,000, hesides $197,000 in fine silver. There were also two smaller shipments to the West Indies and France. The exports of gold from New York for the past five weeks amounted to $10,255,700 against $306,200 imports. It was expected that returning ease at London, Paris and Berlin, and a renewed activity in produce exports at New York would have checked this ontward flow of gold before now. But there must he elements at work which do not appear on the surface.

NEW SUPERINTENDENT.—Chas. Waldeyer, for a long time Superintendent of the Spring Valley mine, Cherokee Flat, Butte county, resigned his position this month. Mr. Waldeyer is well known in this State for his connection with the gravel-mining interests. He was a contrihutor on the subject to the U. S. Mining Commissioner's reports. Mr. G. F. Williams, who so successfnlly engineered the new tunnel, which we described and illnstrated in the PRESS of Dec. 31st last, has been appointed Superintendent of the mine. Mr. Williams, though a yonng man, has shown marked ability in his profession, and the appointment is eminently a proper one. He will now have an opportunity of exercising the executive ability of which he is known to be possessed. He is the son of Col. A. F. Williams, of Oakland, a well-known mining man, and who last season managed a prospecting expedition in Alaska.

CAPITALISTS are said to he flocking into Sonora. Throughont the State, new mining developments are being constantly made, and extensive preparations for the opening of old mines are engaging the attention of mining men.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

GOVER.—Amador *Ledger*, March 11: They are hoisting water at the Gover mine, with a view to commence working the mine. Hughes & Maxwell found 2 nuggets a few days ago, one weighing $20 and the other $19. They have changed their hase of operations to Mill gulch.

PLYMOUTH.—Madam Rumor has it that an almost unlimited deposit of gold was found in the Pacific mine last week. It is said that pieces of almost pure gold weighing $20,000 were taken out. I am unable to say whether it is true or not, but know that it is no better luck than Hayward usually meets with in new enterprises.

FROM VOLCANO.—The Downs M. Co. has just cleaned up, it being one of the largest ever made, amounting from $15,000 to $20,000.

MILL.—Amador *Dispatch*, March 11: Mr. A. M. Vaughn, the champion mill builder, has returned to town, he having just completed another 5-stamp battery for the Church Union mine, and we understand from him that the hoisting works of the above-named mine are going to he run by water power. One of Mr. Knight's improved wheels is to he used for the purpose. He also informs us that everything around the said mine, under the able management of Mr. L. R. Poundstone, is working to the perfect satisfaction of all parties concerned.

JUDGE REAVES has got his arastra to work, and is now putting through the auriferous at the rate of 3 tons in 24 hours, and, we understand, the prospects are of the most flattering character.

ETNA.—We have heard to-day that the Etna is yielding in a most magnificent manner, and there is no doubt but the enterprising parties now having the mine in charge will he duly recompensed for all the outlay they have made in opening this mine and putting in the necessary machinery to work it. Your correspondent has had a residence of nearly 33 years in the mines of California, and helped to make a sinking of 100 ft in this mine some years ago, and from north to south, and east to west, have never seen anything that looks like this deposit. The sulphurets lie in a heavy mass, in size from a pin-head to the size of a hen's egg, and seems to be embedded in a thin black muck or slum, and, at the bottom of the sinking we helped to make, it seemed that there was no limit to it, and free gold was visible sticking to almost every sulphuret, either small or large, that you might pick up. This vein is traceable for the distance of many miles between the Middle and South forks of the Cosumnes river, and, in fact, until it is hidden from view by the everlasting lava and cobblestone deposits.

PROSPECTING.—A good deal of active prospecting is going on, both north and south, and it is not all assessment work, for some of it is of a most permanent character, and we expect ere long to be able to chronicle some remarkable discoveries.

ITEMS.—It is reported upon the reliable authority that the California Bank intends at an early day to commence operations upon the Alpine.....Mr. Green Aden, who owns the land and mining property next, south, from the Pacific, informed us a few days ago that he was negotiating a sale of his mining property to a company from New York, and that he would receive every cent he had asked for it. Mr. Aden is one of those miners that do not believe in bonding mines.....Irish Hill is supplied with an abundance of water, and Mr. Phillips, the accommodating ditch agent, tells us that the prospects for the year's run were never better.....Whilst we hear very flattering accounts from Forest Home and Michigan Bar, and balancing everything, the cold and severe weather, the high price of hay, etc., I do not think there is any great cause for growling in this part of the county, unless it is with the patrons of the Plymouth school district.....It is expected that with the opening of the spring a new impetus will he given to mining in this part of the county, as we know from our own personal knowledge of a good many "bonded" claims that will be forced, under the contracts of the bonds, to commence work at a very early day, or else forfeit their bonds.

BUTTE.

BUTTE CREEK.—*Record*, March 11: In an interview with Pres. Longley a reporter learned that the Whisky Flat claim is now idle, work having been suspended while a new flume was being built, about 300 yards of the old one having been washed away by a recent freshet. The claim is located on Butte creek, about 2 miles above Helltown. It is a good claim, and has paid its owners well for their labor.

COLE CLAIM.—One of the best mines in that section of the county is the Cole claim, near Centerville, which has recently been purchased by a company of San Francisco capitalists. This claim has paid well from the start, and about $200,000 worth of gold was taken from it not long ago. The owners now have 25 men employed, and will shortly double the number. The latest improved machinery is used, and only experienced workmen are employed. A tunnel 2,000 ft long, with an opening of about 6 ft in diameter, has recently been completed in this mine. After the tunnel, entering so far into the heart of the mountain, had been completed, it was impossible for the workmen to enter it on account of foul air. Machinery was then purchased, and a shaft was bored from the top until it tapped the tunnel, which admitted plenty of fresh air. The shaft had to be sunk through a lava formation, and required a long time to complete it. But the fortunes of the owners are now assured. Three cars are kept constantly at work hauling dirt from the tunnel.

THE HART MINE—This well known and valuable claim is situated near Centerville, on the east side of Butte creek, and is in the Lava mountain. Mr. Crow, the superintendent, is an experienced miner, and is working this claim with flattering results. They now have a tunnel extended over 230 ft into the mountain, and have come across plenty of rich gravel, and a bonanza seems almost in the grasp of the owners. The tunnel was made in about 2 months, and will he pushed farther into the hill. Mr. Longley says that there is a stratum of goldbearing gravel in this claim, lying between the lava and the bedrock. This sort of gravel makes the heart of the old miner leap high. It is rich with the precious yellow metal, and does not require much labor to handle it. The gravel in question runs in depth from an inch to 10 ft. It has cleaned up $300 to a carload, holding about 5 wheelbarrow loads to a car.

CALAVERAS.

MONARCH.—*Mountain Echo*, March 7: It is said that work will soon be resumed on the Monarch mine, which has been lying idle for some time.

BOVEE.—Work has temporarily suspended on the Bovee mine, but will be resumed as soon as the weather settles.

CRUSHING.—The Matson Bros. have just commenced crushing ore from Fred Brunner's mine, near Albany Flat. This mine has never been thoroughly tried, but from what prospecting has been done on it, it is supposed to he a paying mine.

THE Rasberry mine, on the old Smith's Flat lead, is now being worked by a man named Patch. He is running an open cut into the hill for the purpose of giving the mine a thorough prospecting. This mine was discovered about the year 1855 or 1856 by Benega Rasberry, of this town, who, it is said, made a good deal of money out of it.

THE Dolan mine, the sale of which to Drake & Co., of San Francisco, was mentioned in a previous issue, is paying well, and never presented a finer appearance than at the present time. It is thought that the new company, upon taking charge of the mine, will erect a 60-stamp mill. There is, perhaps, no other mine in the State where the ore can he obtained at so small an outlay.

CAVED ON.—Calaveras *Chronicle*, March 11: Thursday last Mr. C. L. F. Brown, one of the proprietors of the Green

Mountain claim, on Tunnel ridge, about 1½ miles from this place, had a very narrow escape from death by being caved on. It seems that they are running a new tunnel, having abandoned their old one some months ago on account of the dangerous character of the ground, it being almost impossible to timber it so as to keep it from caving. Mr. Brown was working alone in the tunnel when, without any warning, the cave occurred, catching him about the head and breast, but luckily breaking no bones. With some difficulty he extricated himself from his perilous position, and managed to reach the "month" of the tunnel, where assistance was procured.

EL DORADO.

ENLARGING.—Georgetown *Gazette*, March 10: The Caf. W. & M. Co. is now engaged in enlarging its big reservoir just north of town. They are using a pipe and nozzle, which is being run day and night. The capacity of the reservoir is to be increased some 10 ft in depth.

TUNNEL.—Henry Jones, lessee of the old Marion England seam mine, is running a tunnel which will tap the quartz seams some 200 ft in depth. Henry is an experienced and drive-a-head miner, and is deserving of finding a bonanza.

GREENWOOD.—We have reason to believe that Greenwood district will be among the foremost this coming season in mining activity and bullion yield. In addition to the Argonaut, we have it from reliable source that two more important mines will shortly be fitted up in good shape.

STRIKE.—A rich strike was made yesterday in the Rich Gulch mine, just south of town, by Messrs. Baldwin & Adams. They took out a clean 600 ounces, which was sold to Sonnberger & Lane, amounting to $1,800. The mine belongs to T. Z. Armstrong and A. Baldwin, who paid W. H. Collins some $300 for the claim nearly one year since. Mr. Adams leased Armstrong's half of the mine last fall.

NIAGARA.—Tuesday we had a call from Mr. H. Von Bremen, manager of the Niagara Co.'s mines, from whom we obtained the following information. The Von Bremen mine is shut down, on account of its not paying. The Dolly Varden mine is being worked, with fair prospects of developing into a paying property. They have run a tunnel from the river 100 ft, and have struck the seams and commenced hydraulicing.

INYO.

BISHOP CREEK.—Inyo *Independent*, March 11: From Chas. Hollenbeck, superintendent of the Laura mine, I learn that the mine is looking well, and that the mill is being completed as rapidly as possible. An extra force of 20 Indians has been put to work on the road now being constructed from Waucoba to Saline valley, and, as soon as it is completed work will be commenced upon the rich extensions of the Laura.

MINING VISIT.—Supt. Jas. Cross, formerly of Mammoth, at present in charge of an extensive mining work at Candelaria, accompanied by Mr. Andrews, another experienced mining man, were in town yesterday. They took a look at some mines across the river, and will probably inspect several other properties before returning home. Mr. Cross gives positive assurance that the Carson and Colorado railroad management intends to push the road to and through this valley with all practicable speed, and says that the work is going on now as fast as possible.

KERN.

MINING INTERESTS.—Cor. Inyo *Independent*, March 11: The mining interests of Kern county are looking bright. Those of Indge Colby have been purchased by the Hirshfield Bros., of Bakersfield and Tehachipa. In the Long Tom mining district, some 25 miles northeast of Bakersfield, on Posey creek, they have a 10-stamp mill, which is running under the supervision of Mr. Webb, an old resident of Kernville. The ore pays $10 per ton, and there is about 400 tons on the dump. There is a contract unlimited for more ore at $4 per ton, timbering the mine included. The price paid for the mine in the way of trade was $100,000. The Yukum mine, that there was much trouble about a few years ago, when Tucker and Johnson lost their lives, is being worked with good results. Also some new mines lately discovered are developing fairly. Taking everything into consideration, the Owens River country has a fair rival in the Posey district in the way of mines.

MARIPOSA.

COMPROMISE.—Mariposa *Gazette*, March 11: The Compromise mine at, Marble Spring, is reported by several gentlemen of large mining experience as being one of the best mines west of the Rocky mountains, and I believe it to be so.

GRUB CULCH.—Cor. Mariposa *Herald*, March 10: Improvements are advancing in a quiet way. New roads and new mining discoveries keep up hope and an anticipation of a bright day dawning upon our laboring classes of now idle men. The mines in and about Grub Culch are prospecting very well.

THE RED ROVER is now down about 50 ft, the vein growing larger and richer as they go down. They are getting splendid prospects, and the mine is daily enhancing in value, and bids well to the shareholders for a bonanza.

THE Gambetta and McDonald mines are considered to be good. Considerable prospecting is being done all over the country hereabouts, with, in many instances, very flattering results.

I AM told the General Garfield mine, near Metcalf's ranch, prospects well for surface rock. The vein looks well and is about 2 ft thick, with another vein, showing fine sulphurets, in about 4 ft above it. It is owned by John Strebie and J. M. Duncan. We believe there is a large area of good mining country out here. If know of no better field for prospectors to strike a bonanza than in this part of the country.

NEVADA.

THE GOLD POINT.—*Foothill Tidings*, March 8: Work is going steadily forward on the new prospect known as the Gold Point, located southeast of the Idaho Mt. Co's ground. A shaft is being sunk and is now down 40 ft. The shaft is 11x5½ ft in the clear, and shows a most promising ledge. Mr. James Bennalleck is the superintendent of the company, and, under his management, the mine will undoubtedly be speedily developed. Five men are now employed on the property, and before many weeks the force will be greatly increased.

SCOTT'S FLAT.—Cor. *Tidings*, March 8: Scott's Flat assumed a lively appearance; it's all hustle and work. Jacobs & Co., of Quaker Hill, set likewise their hydraulic powers to work, and the hillsides have to come down. Mr. Turner, of Hunt's Hill, was one of the first who got up metal and waded in to search for this precious metal. Mr. McCloud and his sons followed suit. So you see the world will soon be once more enriched by that stuff which makes mankind so mean.

I was told that in the Murchie mine, on Deer creek, above Nevada City, they had found well-paying rock, better than ever before found in that mine. There is also a slight rumor of having found a new quartz ledge, somewhere in this vicinity, though I know no particulars about it.

HOMEWARD BOUND MINE.—Grass Valley *Union*, March 9: The enlargement of the incline shaft from 2 to 3 compartments has been completed from the surface to the Menlo tunnel, where a large station has been opened. At the bottom of the shaft, 283 ft deep, the north drift is being extended from the point reached by the working of the old company. A ledge of good-looking quartz shows in the drift.

SIERRA.

SEVENTY SIX.—*Mountain Messenger*, March 11: The Seventy-six Co., near the Pliocene shaft, have their tunnel in gravel, and find the bedrock pitching away from them, demonstrating that they are much too high. The length of the tunnel run is about 600 ft. The company worked rich ground in a lower tunnel, but the bedrock raised so rapidly that they were compelled to run another, which is, unfortunately, as much too high as the other was too low.

PAT.—Jack Billings has found some very good pay gravel in his diggings at Sebastopol. He has taken out as high as $30 a day, 2 men working.

RUBY.—The Ruby Co. has run some 600 ft east from the shaft at the end of their main tunnel, but have not yet struck any gravel. They are working from 15 to 20 men.

RAINBOW.—The Rainbow, at Chips Flat, have got better air by opening into the old works away below. They found a long stretch of the tunnel standing, and in as good order as the day it was run.

RUBY.—It is reported that the Ruby Co., of Carriboo ravine, have struck gravel in their drift from the shaft.

GEO. ORR, the man who was so severely hurt in the Bald Mountain mine last week, is on the mend, and his recovery is considered only a matter of time.

BUNKER HILL.—John McDonald, of the Bunker Hill mine, Little Grizzly, was in town this week. The company is not doing much just now because the water used in its air blast is frozen. The claim is paying well.

NEW MILL.—D. B. Keyes and others, owners of a quartz mine of gold and silver, at Antelope neck, Sierra valley, have made arrangements to have a 6-stamp quartz mill erected upon their property in the near future. The rock assays about $60 a ton in gold and silver.

SHASTA.

SUSPENDED.—Shasta *Courier*, March 11: The Conger prospecting shaft at Eagle creek is down 130 ft. Work has been suspended until the rains are over.

TRINITY.

OUTLOOK.—Trinity *Journal*, March 11: The mining outlook is at present reasonably favorable, and the general expectation is that the hydraulic miners will have an average season, with a fair average yield.

NEVADA.

WASHOE DISTRICT.

CONSOLIDATED VIRGINIA.—*Enterprise*, March 12: On the 1050 and 1750-levels are still cleaning out and repairing the drifts and winzes connecting with the old Con. Virginia shaft.

CALIFORNIA.—On the 1050 and 1750-levels are still cleaning out and repairing the drifts and winzes connecting with the old Con. Virginia shaft.

SIERRA NEVADA.—On the 2700-level drill hole No. 1 has been extended 175 ft, and the joint Union Con. east wieze has been sunk and timbered 10 ft.

OPHIR.—During the week 28 tons of ore have been extracted from the croppings.

MEXICAN.—On the 2700-level the main north lateral drift has been extended 18 ft, and is now being timbered up; on the main south drift are cutting out drain and cleaning up. West crosscut No. 1 has been extended 12 ft.

UNION CON.—During the week 124 tons and 400 pounds of ore have been extracted from the 2500 and 2700 levels.

SUTRO TUNNEL.—Two shifts of repairmen have been employed since last report near point 10,400 retimbering and repairing. They put up 17 sets and three posts of new timbers, and removed 27 sets and seven posts, besides repairing and bracing other timbers and making general repairs. Between sections 108 and 172 a few repairmen have been repairing the track near this point, and bracing down the main boxes and filling in around them so that the cold water will run over them. No work has been done in this tunnel since last report.

YELLOW JACKET.—The pumps have been kept running at five strokes per minute since the last weekly report. The water this forenoon is 95 ft above the 2300-level station, and is evidently reaching the elevation of its head, as it has risen but 9 ft during the past five days, and but 18 inches in the past 24 hours. Five strokes per minute was the speed required to keep the mine free of water before the extra flow from the Excbequer mine came. The pumps at five strokes throw 800 gallons a minute. At seven strokes and with the assistance of hailing tanks we can discharge 1,500 gallons per minute. No other work is being done in the mine at present.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, March 11: A total distance of 93 ft has been added to the main shaft since sinking was commenced, 9 ft of progress being made for the week. The fourth shaft level presents very much the same appearance as at time of last report. Twelve ft have been added to the depth of the main winze, the total depth on an incline being 102 ft. There is no material change in the other shaft levels, the adit and the levels above looking about the same as a week ago, and are producing the usual quantity of ore. The daily yield of ore has been about 53 tons. Both mills are running steadily and doing good work. Bullion shipments on March account amounted to $15,325.85 to the 9th instant.

MOUNT DIABLO.—The stopes above and below the third level are looking well. That on the second level above the west drift is showing an improvement. A 12-inch ledge of $65 ore has been opened in the winze connecting the second and third levels, and the outlook at this point is favorable. The ore near the center of the mine, below the second level, is opening well and is looking encouraging, an average of the ore pile giving an assay of $132 per ton. A bunch of good ore, assaying $125, has been encountered while extending an old stope above the first level near the shaft. Bullion shipments for the week have been $9 408.71 on the 4th instant, and $6,705 90 on the 7th instant.

EAST MOUNT DIABLO.—The drift into this property from the Mount Diablo shaft is being pushed forward very energetically. Harder ground has been encountered during the week, yet fair progress has been made. The end of the drift is now 37 ft beyond the dividing line of the two mines.

GENERAL JACKSON.—Considerable ore is being extracted from the stope, appearances indicating that the yield will be good for an indefinite time.

CHERRY CREEK DISTRICT.

BETTER TIMES AHEAD.—White Pine *News*, March 11: There is no denying but the present dull spell is being keenly felt by our people; but we should remember we are no worse off in this respect than the people of our sister towns throughout the State. Indeed, it is not at all probable that the present business stagnation will last over a month or six weeks at the farthest. Spring will then have fairly opened, and a revival of our mining industry will loom up. By that time the Star will have opened out its 700-level, which, it is confidently expected, will place the future of that property on a solid foundation. The Exchange and Teacup companies are also getting their business affairs straightened out and will most likely resume work before the 1st of May. The San Jose Co will very likely start up their mill and increase their mining force by that time. At Ruby Hill it is almost among the certainties that a live company will take hold of the valuable mines there and begin their development at an early day. The Silver Canyon mine is are also likely to pass into the hands of capitalists who will work them on a systematic scale. So that really the prospects of this section of the county for the coming season are as good as at any time in the past. We see no cause for despondency.

CENTRAL DISTRICT.

REDUCTION WORKS CLOSED.—*Silver State*, March 9: The Winnemucca Reduction Works, after a run of nearly seven months, were shut down yesterday for repairs. The proprietor, Mr. Alex. Wise, has teams engaged in hauling ore from the Keystone mine, in Central district, to the works, which will start up again as soon as repaired, and there is sufficient ore on hand to run them a month or two.

EUREKA DISTRICT.

STRIKE IN THE EUREKA CON.—*Sentinel*, March 12: It has been rumored during the last three weeks that bodies of ore had been encountered in the Eureka Con. mine, and that the new find continued to improve as it was uncovered. The same rumor was heard again on the streets yesterday, and comes to us from several different sources so directly that there seems to be no doubt of its correctness. Ore has been found in upraises from the 900 level, and in several places also below this level. The ore found is rich ($800 per ton) carbonates, with streaks of black sulphurets running through it. The extent of the ore bodies discovered is not yet determined; it is believed to be considerable, though at present the showing is not what the bears would call a "bonanza." The rise in the stock recently is accounted for by this ore discovery. Still there has been no deal. During the whole time in which the stock was climbing up from $10 to $19 50 there were comparatively few shares sold, probably not more than 1,000 changing hands.

ESMERALDA DISTRICT.

A NEW ERA IN MINING.—Esmeralda *Herald*, March 12: The starting up of the Humboldt mill and the successful operation of the same has given a fresh impetus to mining in Esmeralda district, and the coming summer promises to be an active one. Mine owners can now get their ore milled at a reasonable rate, and they have not lost much time after the mill was started to take advantage of the opportunity. During this week the Crocket and Ophir mines have been leased to several of the most experienced miners of our district, and they are already actively engaged taking out ore. Although there has been considerable rich ore in sight in the former, the property was lying idle for about fifteen years, there being no milling facilities which would warrant the owners to extract it. The Ophir is a late discovery, ore in paying quantities being found only about a year ago. It being rumored about that there was a very important change in the appearance of the Centennial ledge, a representative of the *Herald* made a special visit with a view of ascertaining the exact condition of it. At a point about 340 ft below the tunnel, in the incline (which had been pretty well cut and broken for several ft), is found to go down at the same nice, regular dip as above, and have the same smooth, hanging wall, the ledge being the full thickness of the winze and carrying considerable gold. The most encouraging thing is that the owners realized from the proceeds of about 20 tons of the best ore, which they were compelled to remove while putting down the winze, enough money to pay for all the work done, the whole body passed through, remaining intact. Besides what they have milled from the winze and drifts, there is now over 100 tons on the dump. The owners of the New Esmeralda are busily engaged taking out ore.

LEWIS DISTRICT.

THE NEW MILL.—Lewis *Herald*, March 8: On Thursday afternoon the boilers at the new mill were heated up, and about 40 pounds of steam raised. The new engine was started and moved off smoothly and without a hitch. The engine run a couple of hours to the perfect satisfaction of all concerned. During the trial of the engine, L. M. Pugh of the Lewis Hotel made his appearance with a basket on one arm and a couple of boxes of cigars under the other. All hands joined Lew in a bumper of champagne and something a little harder, wishing success to the builders and owners of the Highland Chief mill, and that the sound of her stampe might be heard through the canyons of Lewis for many a day.

STARR-GROVE.—The south drift from the Clark incline, in the Starr-Grove mine, has been advanced 11 ft during the week ending Saturday, March 4th—total length 18 ft. The ledge has not changed, and carries considerable black metal. The north drift on same level has been advanced 6 ft during the same period.

CHLORIDE.—The main tunnel on the Chlorido mine has been advanced 16 ft—total length 507 ft for the week ending March 4th. The ledge has not changed in appearance since last writing.

SUN BEAM.—The winze from the lower level of the Sun Beam mine is still in good ore, and about 50 pounds of the ore is on exhibition at the office of J. P. Courtier.

BETTY O'NEAL.—The stopes in the Betty O'Neal mine are still turning out the usual quantity of ore, and from appearances are liable to do so for some time to come. The ledge in the south lower level still improves both in quality and size. We understand the ore will be hauled to the mill as soon as the weather moderates sufficiently and the roads are in passable condition.

HIGHLAND CHIEF.—The miners in the Highland Chief mine have all been laid off till further orders from New York. The pumps will be run for the present and the mine kept in condition to start at any time. The Bothwell incline has attained a depth of 277 ft, and the south drift from the second station is now in 95 ft, with seams of good ore running through the breast. The quartz is very hard and differs in appearance from that taken from the Starr-Grove mine.

STAR DISTRICT.

RICH ORE.—*Silver State*, March 11: A carload of ore from the De Soto mine, at Star, was shipped to San Francisco recently. The whole load, something over 10 tons, averaged $922 30 in silver, and $15.07 in gold to the ton. This ore came from the only mine in the county that has been opened over 300 ft below the surface.

ARIZONA.

CLIFTON.—Cor. Arizona *Star*, March 9: The Longfellow Copper Mining Co. have let a contract for work to the amount of $50,000 on the extension of their railroad to their mines. Fifty or 75 miners can get work in this camp at from $3 to $4 per day. J. J. Stevens & Sons, the owners of the Copper King mine, have run in a tunnel 20 ft on their mine, and struck a vein of copper glance and pyrites of copper. They are now in 9 ft on the vein and are unable yet to tell the extent of the discovery.

ELLSWORTH DISTRICT.—Cor. Yuma *Free Press*, March 11: Some new and valuable mines have been found, and the old ones are developing beyond expectations. The Socorro, belonging to the Oro M. & M. Co., is turning out high-grade ore, and the whole ledge will mill at a good profit. The main shaft is down about 50 ft and the ore is steadily improving with depth. The Oro, which is the property of the same company, looks extremely well. At a depth of 65 ft water has been struck in the shaft, which was somewhat surprising to every one, but gives new life to the camp, as we can now calculate on an abundance of water for hoisting and reduction purposes, without expense of transportation. So far the ore below the water line is free milling, containing an exceedingly small percentage of sulphurets. Developments in the Yellow Jacket mine are creating a great deal of excitement, uncovering a body of ore as fine as one would care to see. The shaft is down 25 ft, showing a 3-ft ledge gradually widening with depth. The Good Luck is another mine which is coming to the front and will, in time, show we have silver as well as gold ledges. The ledge is large and a says well in gold and silver. In fact, there is no place in Arizona where there are so many mines, and when capital once takes hold of this district it will prove to be one of the leading ones of Yuma county and even the Territory. The whole camp is busy and all are doing their best without waiting for Capital or any other man to perform their work.

IDAHO.

STRIKE AT BULLION.—Wood River *Times*, March 8: A report of a strike in the Jay Gould mine, at Bullion, has been in circulation during the past few days. The *Times* is, however, reliably informed that the strike was made in the long drift being run in Jay Gould ground, near the line of the Mayflower, and at a point somewhere between 250 ft and 300 ft westerly from what has hitherto been considered the main ore vein or channel, not only in the Jay Gould, but in the Mayflower, Bullion and Ophir mines as well. This drift was started, early last fall, in search of the foot or westerly wall of the vein, which had not been satisfactorily defined. Owing to the opinion which has heretofore prevailed about the narrowness of our veins, it was generally believed that the west wall would be reached in 20 or 30 ft, at farthest. When, however, over 200 ft were run without any sign of a wall, grave doubts arose as to the correctness of the opinion above referred to, and many competent miners expressed the belief that the (supposed) western vein on which the O. K. and other mines are located was only the other or missing wall of the vein. The correctness of this theory remains to be proved by an underground drift which shall connect the workings in the easterly and westerly series of mines. But, whatever may be demonstrated by such a drift—if it is ever run—the fact remains that no foot wall has yet been found to the Bullion vein, and that a second ore channel has just been discovered. This new find is 18 inches thick, of solid galena, rich in native silver.

MONTANA.

THE ALTA MONTANA CO.—Helena *Independent*, March 11: One of the most serious drawbacks to the successful operation of the reduction works at Wickes during the past winter has been the need for a larger quantity of water than their ditches have supplied. With the spring warmth on the hills there will be a sufficient supply for temporary use, and before the season dries up the surface flow, there will be plenty of it coming through the long conduit, which is nearly completed in Spring gulch. With all adverse circumstances incident to the cold season, progress has been made in the manufacture of bullion. The smelter has produced for the month of February 1,-131 bars, weighing 130,387 lbs., carrying 30,374 90 ounces of silver and 233.06 ounces of gold. The amalgamating department has turned out during the same time 7,423 ounces of silver and 16.12 ounces of gold. With an adequate supply of water the concentrator can do much more effective work, and it is expected that the bullion output will be much more largely produced, and the works here more certain of continuous and economical operations.

BARKER DISTRICT.—Cor. Helena *Independent*, March 11: Mr. Maddox, of Boston, President, and Mr. Tillinghast, of Chicago, Treasurer, of the Clendenin M. & S. Co., of Barker district, arrived on this evening's coach, having been unexpectedly called here by the untimely death of Col. Clendenin, resident manager and secretary of the company, at Barker. These gentlemen come to perfect arrangements who eby the operations of the company may be continued, the death of Col. Clendenin, who was the inaugurator of the enterprise and its leading spirit, having caused a temporary suspension of the work. This company has invested an immense amount of capital in the Barker district, and has, under the superintendence of Prof. N. A. Foss, erected a smelter with a capacity sufficient for all the present needs of the company. Actual work has demonstrated that it can successfully and profitably handle the ores. The presence of Messrs Maddox and Tillinghast is evidence that the enterprise so successfully commenced will not be allowed to lag for want of attention or ample capital.

THE LAST CHANCE LODE.—Important developments have recently been made by Messrs. Merrill & Shaef in sinking a shaft on the Last Chance lode in Pioneman mining district. Samples of ore from the vein—which is 3½ to 4 ft wide—assay as high as 413 ounces per ton in silver, and $34 per ton in gold. The prospect is owned by the above named gentlemen, who are now running a tunnel in on the lode.

NEW MEXICO.

THE TORRENCE.—Socorro *Miner*, March 8: Last Sunday a representative of the *Miner* made a pilgrimage to the Torrence mine. Almost half way up the side of the mountain the mouth of the shaft is situated, and is sunk to a depth of nearly 300 ft. There are two drifts or levels, from both of which immense quantities of silver-bearing spar are taken. The lowest level, however, is said to be by far the richest lead, and is developing better all the while. At present no ore is being raised in consequence of putting in new machinery, etc., but men are still working regular shifts beneath, mining and breaking the rock ready for hoisting. A new engine and boiler have been put in place, much stronger than the old ones and with greater capacity, which will be in running order in a few days. About 75 men are employed there at wages ranging from $2 75 to $3.50 per day, and in a short time it is intended to double the force. The greatest inconvenience experienced there now is the scarcity of water, which has to be hauled a distance of 2 miles; but it is anticipated that water will soon be struck at the bottom of the mine sufficient to meet the demands at the top, and which can be hoisted at very little expense. A railroad has been surveyed from the stamp mill to the mine, work upon which will probably be commenced in a very short time. The Torrence is one of the best developed mines in the Territory and is said to be netting its owners $1,000 a day. It practically settles the question of profitable mining here, and furnishes ample proof of the fabulous sums hidden in these mountains, awaiting only the advent of capital and enterprise to find them. The Robinson mine, 3 miles west of the city, is down over 100 ft and is said to be developing fairly. They are putting in a new engine and hoisting machinery, and will be raising large quantities of rich silver-bearing quartz in a short time. They claim to have struck the same lead which is now being worked by the Torrence. The mountain in the vicinity of the Torrance and Robinson mines is covered with prospect holes, which some day will undoubtedly be valuable.

CLIFTON.—*New Southwest*, March 11: Clifton is experiencing a genuine boom. Claims are being actively worked. Dr. Welsh is nearly done laying pipe for his hydraulic works, and the Longfellow Mining Co., is laying track for a narrow-gauge railroad from the Longfellow mine to the Coronado, 6 miles distant. Clifton has enough copper bid in her hills to supply the world.

SILVER CITY.—Some important sales will soon be made in Silver City mining property, and the near future will behold a marked change in the management of mining property in this community. The Sherman mine has already taken a jump, and under the efficient superintendence of Geo Henderson, a gentleman of long and successful experience in Nevada mines, it will soon be producing as much bullion as any mine in the Territory. We are informed that the famous Black Hawk mine, the property of W. Jay Porter and others, was sold yesterday for $100,000. The deeds are in escrow, and the sale will be consummated in 30 days. The bargain, if concluded, will be a good one for both parties, and we congratulate them and Grant county. Mr. Shedd makes the purchase for Eastern parties. Judge Potter and others have sold their Carlisle mine, at Steeple Rock, Grant county, for $110,000, the purchasers being Wm. A. Farrish & Co., owners of valuable mining claims in Colorado, and the Grand Central mine, at Tombstone, Arizona. A full force of men with 3 wagon loads of supplies were sent out on Wednesday to commence operations, and we may soon look to that district for bullion.

OREGON.

NOTES.—*Sentinel*, March 11: Will Q. Brown, of San Francisco, has purchased the mining interests of Wm. Briggs, near Canyonville, for $700—copper and nickel. .....The Sterling Hydraulic Co. is piping day and night, with a moderate head of water, the continued cold weather in the mountains preventing the melting of the snow and a full water supply..... All the miners on Sardine creek are busy ground sluicing with full heads of water and making good wages.....Cale & Cowan have some rich ground in the Birdseye claim on Foot's creek, and manage to pick up considerable gold from the bedrock.....Joe. Anderson is now running the '49 claims with excellent prospects.....Chas. Howard is engaged in a survey for the large ditch being constructed by Gin Len, from Palmer creek to the Red hills.....From every point of Josephine county we hear that miners are busy with an ample water supply and making up for lost time. .....All the large hydraulics on Galice are now working day and night.....A clean-up that turned out well is being made at the Applegate gravel mine..... The large reservoir being constructed by the Squaw Lake Co. is nearly completed.....The king bolt in the "giant," of Chappel & Co.'s claim, was displaced one night this week, by the wearing out of the threads, and the pipe of the giant was blown quite a distance, the piper barely escaping a serious injury. Damages have been repaired and work goes on as usual.....Green Bros., of Josephine, are running their anastras on very rich quartz with a large supply in sight.

UTAH.

HORN SILVER.—*Southern Utah Times*, March 11: The Horn Silver mine is shipping from 14 to 16 carloads of ore per day to Francklyn, besides keeping 2 stacks running at Frisco, which will take at least 4 carloads per day, making an average output of 18 to 20 carloads of ore per day. Several new strikes have been reported in this and adjoining districts within the last few days, but we have not been able to obtain any particulars for this issue.

Cellular Growth of Plants.

Last week we had an illustrated chapter on the growth of the tree and the formation of wood. Upon this page we pursue cell growth fnrther, using for this purpose an illustrated paper recently read at the Academy of Sciences by Dr. H. W. Harkness, as follows:

In presenting, as I propose to do this evening for yonr conoideration, the vegetahle cell and eome facts pertaining to its life history, I ehall rely upon the recorded observations of Mohl, Sachs, Cohn and others and shall claim no originality for myself, nnless it be in the manner of illustrating the snbject.

This tiny speck of matter is year hy year assuming greater importance and is heing eagerly scanned hy men of science. When we take a retrospective view of the progress which has heen made in this line of investigation within a recent period, we have good reason for helieving that the patient and close obeerver will he rewarded, hy bringing to light many new and valuahle discoveries—discoveries, too, of such a nature and of so mnch importance as to to cast a flood of light upon many of the nnsolved prohlems pertaining to hoth animal and vegetahle life. For in this little, tiny cell is to he fonnd the physical hasis of hoth animal and vegetahle life.

To the cell and its multifarious transformations he must turn, would he wish to gain a knowledge of the growth of the trunk, the circulation of the sap, the formation of the leaf, the flower, the fruit, while on the other hand would he seek the ultimate molecnle of matter, he must marshal the forces contained within the cell, and from the cell itself go hackward to granule, from granule to cytohlast, from cytohlast to fluids, from fluids to gases, and from gases to the spectre—haunted chambere of analytical hypothesis.

The greater number of cells in snconlent plants are composed of three distinct layers, first, an outer firm investment which is desig-nated as the cell wall, and which consists of a suhstance peculiar to itself, termed cellulose. In close proximity to the cell wall lies a second memhrane of far greater interest, the primordial utricle, or protoplasmic sac. This is an exceedingly delicete memhrane formed from protoplasmic matter, and contains within its walls all of the protoplasm.

As a free hody within this protoplasm, we find the nuclens, or cytohlest, an object of great and growing importance. This hody is now supposed to have an independent invsstment of its own.

For the purpose of more clearly illnstrating this portion of the suhject, I will compare it to an object very familiar to all of you—an egg.

The shell of the egg well represents the cell wall, the lining membrane. The amnion, fitting closely to the shell, will represent the primordial utricle, while the delicete allantois or vitelline memhrene, inclosing the yelk, shall represent the investment of the cytohlast. We have all observed that the amniotic memhrane lies in such close contact with the shell of the egg as to seem a part of it, yet if the egg he carefully dried we find that as desiccation progresses the memhrane separates completely from the shell, and shrinking upon itself still continues to protect its contents.

Were we ahle to make sufficiently accurate observations of partially dried plants, we shonld douhtless find the utricle shrunken in a like manner upon its contents, hnt as our instruments fail us here, we may arrive at the same resnlt by a different mode of procedure.

If we take a thin longitudinal section from near the center of the stem of a calla, and placing it upon a glass slide, allow a few drops of strong sulphnric acid to come in contact with it for a few seconds, we find that the primordial ntricle has completely seperated itself from the cell wall and, with its contents, is completely exposed to our view, as in Fig. 1. If the acid is allowed to remain a few seconds longer, the cell wall is ohliterated and the utricle and its contents set free, and in a condition much like that of the dried egg which hes heen denuded of its shell. The cell contents may now hs examined, and, with the help of chemical reagents, its constituent elsments pretty accurately determined. A positive and complete analysis can hardly he hoped for; hut it is highly probable that, like the colorless corpuscle of the hlood, it contaios all of the elements needful for the repair of waste and the huilding up of new tissue.

Those cells which lie immediately heneath the cuticle are crowded with granules of chlorophyll, while those lyiog deeper contain more or less starch.

Fig. 2 is designed to exhibit these cells, which give to plants their green color. Fig. 3 shows cells filled with starch grannles, a thin slice of potato heing used for tbat purpose; hut as starch granules in their natural colorless state do not show to good adventage when mounted in fluids, I applied a weak solntion of iodine, which has changed their color to a heautiful hlne. Many of the starch cells will he found empty, haviog heen divided hy the rezor in makiog the eection; the etarch hee heen washed out of them.

Amoog the maoy curioue and interesting facts already known regarding cell life, the circulation of the cell eap is one of the moet curioue. This muet not he confonnded with the general circulation of sap in the plant, from which it is entirely distinct. This movement, called cyclosis, or cell rotation, is a rotary motion of flnide contained within the walls of each individnal cell. It is shown in Fig. 4, in which the direction of the movement is indicated hy arrows. A cnrrent of fluid moves along the cell wall until, reaching an angle, it strikes the next wall, when it turns, and, hy another route, finde its way hack to the starting point. This movement seems to he necessary to the well-being of the protoplasm, as if interrupted for any considerahle length of time the protoplasm loses its vitality. This action is in progress in every cell of the growing portion of every plant, unless checked hy external influences, and when we try to realize the aggregate power exerted, we can hut admire this as an amazing instance of the results produced hy the unseen forces of Nature.

When we consider, that in the millions of cells of each growing plant, in meadow, forest and etream, this movement goes on withont panse or cessation, we are ahle to appreciate the glowing langnage nsed hy Huxley in describing this phenomenon: "Were onr ears so attuned that we might hear these tiny maelstroms, the aggregate volume of sonnd would exceed the roar of a Niagara."

It has recently been discovered that a mild cnrrent of electricity arrests this movement; and here permit me to digress for a moment, in order to say, that in my opinion, recorded many years since, thie cell circulation is checked, if not altogether arrested, by the action of our northerly winds. In support of this, I will etate hriefly one or two of eeveral facts wbich go far to prove the trnth of this theory. Anyone who has observed growing plants dnring the prevalence of northerly winds, mnst have noticed that they ehrivel and cnrl hefore the hlast, ehowing signe of the greatest distress, even if the wind has been blowing bnt for a short period; on the retnrn of the soft, moist wind, however, the plants resnme at once their fresh and vigorous appearance.

These changes can be dne neither to desiccation on the one hand nor to ahsorption on the other, they are far too sudden for that, hut they are no doubt attrihntahle to the temporary cessation of cell rotation, brought ahont hy the electrical disturhances which we know take place during the continuance of theee winds.

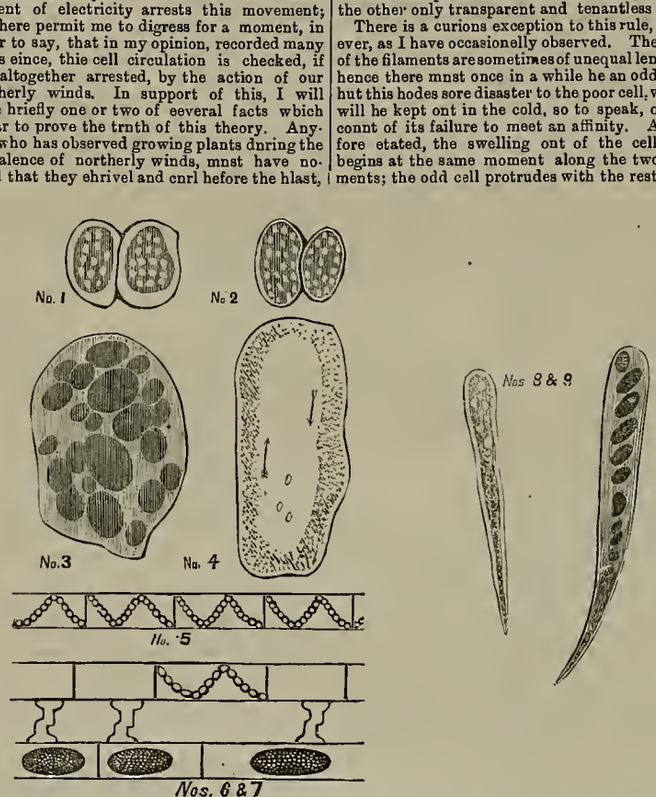
The process of the multiplication of cells varies somewhat, according to the situation and reqnirements of the plant. In a few hnrried remarks made at onr previons meeting, I hriefly described the process of cell multiplication hy subdivision, as it takes place in the protophyte or unicellnlar plant. I then stated that in most of the protophytes the division was either hinary or qnateroate, and that this was the simplest form in which we were ahle to study the process. Ipropose this evening todescribe and so far as possible, illnstrate the formation and growth of the cell in two or three species of a higher order of plants. I have here hefore me a well-known plant called hy botanists *Spirogyra longata*, hy the children frog's hit, which heloogs to a very large order of plants—the Conjugata, so celled hy reason of the method of formetion of the germ cell. This is a long filamentous plant, made up of a large nnmber of cylindrical cells joined together at their extremities; see Fig. 5. The protoplasmic contents of these cells coneist of chlorophyll grenules, colorless glohules, plasmic fluid, and one or more uuclei or cytohlasts. The granules of chlorphyll are arranged in a heautiful spiral within the cell, and give to the plaot its vivid green color.

Multiplication by Conjugation.

The manner in which the germ cell ie formed in this plant is extremely intereeting, and serves to illustrate that of all the speciee belonging to the family. The process may he readily obeerved by anyone who is the possessor of a microscope, and the reqnisite amount of patience. The plants may he found in the proper stage of development in small pools of fresh water dnring the last days of Febrnary and the earlier part of March. In the plants collected during thie period, the following process may he observed: It mnst be remembered that the plant is simply a row of cells. In two plante lying beside each other, slight swellings appear npon the eides of those cells which are contiguous. These protuherances grow in size until they meet and coalesce; immediately after this union, the walls of both are ruptnred at the point of contect, forming a free pessage hetween the two cells (see Figs. 6 and 7).

At this moment the protoplasmic contents of each cell shows eigns of great excitahility, the chlorophyll grannles immediately separate and destroy the beautiful spiral threads, and mixing with the rest of tbe protoplasm, present for a time an appearance not nnlike that of stsel filings nnder the influence of a megnet. After a short time, however, the contents of one cell rushes through the opening into the other, where the protoplasm of hoth instantly combine to form a germ cell of the most vivid green. This process is hsing repeated in every cell at the same moment of time, and as the result, we have in one plant a row of vivid cells, and in the other only transparent and tenantless ones.

There is a curions exception to this rule, however, as I have occasionelly observed. The cells of the filaments are sometimes of unequal lengths, hence there mnst once in a while he an odd one; hut this hodes sore disaster to the poor cell, which will he kept ont in the cold, so to speak, on acconnt of its failure to meet an affinity. As hsfore etated, the swelling ont of the cell wall begins at the same moment along the two filaments; the odd cell protrudes with the rest, hnt



CELL GROWTH AND MUTIPLICATION AS SEEN WITH THE MICROSCOPE.

he is doomed to see the cells opposite him affiliating with his neighhors of the right and the left, while he is left forlorn (Figs. 6 and 7). In a short time, however, the swelling subsides, and he snbmite gracefully to the inevitahle, becoming a "hachelor cell." So far as we can judge, however, he ssems to rather enjoy the situation, at least for a time; he still retains his heautiful spiral of green, is still an object of admiration and attention, and the eye falls upon him at once, on examining the locality. Hie companions have all gone over to the other side and left him, on either hand, a long row of tenantless ahodes. Finally, however, he assnmee a yellow-janndiced hue, resnlting, it may he, from disappointment, then rapidly decays.

These germ cells, so curiously formed, are not at once set free from the parent cell, hut they are retained within the wall of the now dead plant for days, sometimes for weeks, should the conditions prove nnfavorahle. Were they eet free at once they wonld he in the exact condition of the egg denuded of its shell. Instead of this, they are retained and protected nntil a cell wall has formed from the cell contents. This heing accomplished, the water having meanwhile evaporated, this germ is ready with the first favoring breeze to start ont upon its travels.

I need not say to yon, ladies and gentlemen, that ths little plant I have so feehly described is cosmopolitan in its hahit. A germ so well protected and at the same time more huoyant than thistle down, may, when aided hy favoring winds, he wafted across oceane or continents, and ie equally at home in the pools produced hy the meltiog snows of the Himalayas, as it is on the slopes of the Sierras.

The procese I have describsd is termed "cell multiplication hy conjugation." The next in order of importance is that which is termed

Free Cell Formation,

The procese of which ie thus described hy Seche: "In the protoplasmic hody of a cell new centere of formation arise, around each of which a portion of the protoplasm gatbers and forms a cell." In illnstrating thie procese I shall make use of a fnngoid plant, of the order Sphæriaceæ, discovered by me a few days since as a parasite upon the hnckeye. This plant is developed heneath the cuticle of the hark, the firet intimation of its prssence being a slight nodular swelling upon the hranch on which it has fastened. Soon after its first appearance a nnmher of microscopic secs arise from the stroma. These sacs, which are represented in figures 8 and 9, are filled with delicate protoplasmic granules with several nuclei or cytoblasts. These "motber cells," ae they are termed, all develop, in this particular plant, eight germ cells, neither more nor less, in the following manner: At some point in the mother cell we notice a hright spot, or granule, around which a portion of the protoplasm begine to collect and, hy growth and accretion, soon assumee the form of a germ cell. We are often ahle to witness this process in all stages of its development within the walls of a single mother cell, and we may arrest this development at any stege and preserve it for study, as you will see in the specimen nnder the instrument. As in the former instance, these cells remain within the parent cell until the investment of each has hecome consolinated into a firm cell wall, when it too is set free.

Although the process lacke tbe dramatic force of the preceding one, yet it marks a decided advance in the scele of plant developmsnt.

Lighting Mines by Electricity.

In Europe they are doing a good deal more experimenting in the matter of developing the possibilities of the electric light than we are in this country, yet we are by no means idle here. It may interest our inventors as well as the mining community to know that a prizs of $2,500 has heen offsred to the person who produces the best eystem of lighting mines by electricity. This offer comes from Mr. Ellis Lever, of Manchester, a gentleman who has shown a great and practicel desire to improve the position of the working miners of Great Britein, and give them the greatest possihle amount of safety whilst following their employment. Such an offer cannot fail to find a good many competitore at the present time, when so much attention is hsing devoted to electricity for almost every purpose in which coal and gas have hitherto been the principal agents.

Aside from this premium, of course it is well understood that a great reward awaits the inventor of a miner's electric lamp, hecause eo very many would be used. The London *Mining Journal* relates that already lamps have heen tested in some mines where a good deal of gas is given off, and that with a fair amount of success for what may he tsrmed first attempts. In such an application of electricity it ie necessary that the light ehould he entirely cut off from all communication with the air eurrounding the lamp, and for this purpose the Swan eystom has heen found effective, for hy it a nnmher of the lamps can be placed singly in a circuit. The light from an electric lamp in a mine hes been fonnd to he equal to from 12 to 15 candles. The lights proceed from the incandescence of a fine fiher of carhon, the comhustion of which is prevented by its heing inclosed in an exheusted glass hulh. The lamps were inclosed in lanterns which enehled the fragile glass hulhs to he carried ahout without liahility to accident. At one place where the lamp alluded to was tried it was particularly admired hy the workmen for its brilliancy in whatever nosition it was placed, and requiring scarcely any attention whatever. The electricity was supplied by the cnrrent of an ordinary Gramme machine, driven hy a portable engine placed near the top of the upcast-shaft; hut there is an easier method, no douht, for it can he stored up and taken down in a mine and the lamp replenished as reqnired. Seeing that the lampe at prcsent in use not only give a very dim and dismal light, but have heen credited with well nigh having heen the cause of many of the fatal explosions which have taken place at different times, there is every likelihood that they will he repleced hy those lighted hy electricity, and that before long, and for this purpose the indncement held out hy Mr. Ellis Lever cannot fail to he taken advantege of hy those specialists who are now engaged in electrical iuvestigation.

Life Insurance.—We cell attention to tbe advertisement of the Pacific Mutual Life Insnrance Co., in another column. Thie compaoy has for Directors a gronp of well-known and respected citizens of California, and they announce the following as characteristics of their orgaoization:

1. Since its organization, A. D., 1868, it has paid 395 death losses, on policies amounting in the aggregate to $1,098,237.
2. It has paid to policy holders, for matured endowments, dividends and surrender values, in round numbers, $1,600,000.
3. It has repeatedly been examined by sworn experts, and most thorough and searching investigations made of its condition and business, and in every case its solvency and trustworthiness have been demonstrated.
4. Its stockholders and directors are widely known as among the most capable business men and ablest financiers of the State of California, and the integrity of their management is unquestioned.
5. The laws of the State, including the constitutional provisions affecting corporations, are of the most rigid character, such as to make the company one of the safest institutions of its kind.
6. Its policy contracts contain no restrictions upon residence or travel, and its forms of insurance are unusually attractive. The low rate, deposit endowment, and mutual investment policies, are peculiar to this company, and offer advantages to the insured which are not surpassed, if equalled, by those of any other company

The Engineer.

Institute of Mining Engineers.

The annual meeting of the Institute of Mining Engineers recently held in Washington, was well attended and very interesting in its character. It was not conspicuous for scientific interest, but the papers were varied, and all dealt with topics of current importance. The discussion was free and animated, and while not developing any new or startling facts in science, was instructive and interesting. The discussion on tests of iron and steel as structural material, was of immediate and practical interest in view of pending legislation, and expresses very freely the views of engineers and manufacturers of iron and steel as to the necessity of continuing the work begun by the U. S. Commission, which expired, by the failure of Congress to make an appropriation to meet its expenses, about the time the great testing machine now at the Watertown arsenal was finished. The importance of creating a new commission with larger powers and better defined objects, has been brought to the notice of Congress in a bill just introduced, which will receive the hearty support of the entire profession.

It is expected that the next meeting will be held in the far West, partly because many Western members desire such an opportunity to visit the Rocky mountain region, and partly as an accommodation to members in the mining districts of Colorado, Arizona, Nevada, California and other far Western States and Territories, who have hitherto been required to come long distances to attend the meetings.

The Institute is rapidly growing in numbers and influence, and its active membership somewhat exceeds 1,000. Mr. R. P. Rothwell, E. M., was elected to the presidency for the ensuing year.

ANCIENT ENGINEERING.—The ancients, when all is said and done that can be in favor of modern prowess and progress, knew a few things that we moderns have no sort of conception of. In a late celebrated work on architecture, the author says that not only is it impossible to duplicate the great temples of Athens, but it is inconceivable how they were constructed. The same may be said of the temples and the pyramids of Egypt. The Roman roads were superior to any constructed in modern times. Their very remains are stupendous. The ancient canals of India and her immense water reservoirs, including their sites, are incapable of being improved upon. In fact, the very ruins of the ancient are "tremendous." One of the latest discoveries of the wonderful engineering ability of these ancients is the fact that, in preparing to cut a tunnel through the Isthmus of Corinth, it has been brought to light that the Roman Nero, as notorious for his cruelty as for his love of the arts, sciences and literature, had engineers upon the same spot; and more, that the route selected by them has been selected by the engineers now having charge of the modern undertaking. But Nero was preceded by Alexander the Great in the attempt to carry out the colossal undertaking, and, in both instances, the engineers showed themselves to have thoroughly mastered the conditions required for the inception of the work.

RAILROAD CONSTRUCTION IN THE UNITED STATES FOR 1881.—The Chicago *Railway Age* has submitted its statistics of railroad construction in the United States during 1881 which show that the track has been laid on 258 different lines, aggregating 8,242 miles—the largest mileage ever constructed in any one year—that for 1880 having been 7,174 miles, which was greater than that of any previous year, except 1871, when the total reached 7,379 miles. Of the 42 States and Territories in which the work of railway building was prosecuted in 1881, Texas takes the lead with 1,411 miles; Iowa follows with nearly 500, while Maryland is credited with only 25 miles of new railroad, Georgia with 54½, Alabama with 14, Arkansas with 109, Florida with 103, Kentucky with 143½, Louisiana with 236, Missouri with 229, Mississippi with 68, North Carolina with 149, South Carolina with 67, Tennessee with 37, Virginia with 273, and Dakota and Ohio with between 400 and 500 miles each. Of the total mileage, 1,490 miles, or about 14% were narrow gauge lines. With the exception of Texas, through which the Southern Pacific has been pushing its way, the Southern States scarcely make the showing that was expected.

A TUNNEL UNDER THE MEDITERRANEAN.—The latest engineering project is a proposition from the Venetian society of public works, which has asked the government for authorization to make surveys for a project of railway communication between Sicily and the main land by means of a submarine tunnel under the straits of Messina.

A USEFUL WOOD.—One of the hardest woods in existence is that of the desert ironwood tree, which grows in the dry washes along the line of the Southern Pacific Railroad. Its specific gravity is nearly the same as that of lignum vitæ, and it has a black heart so hard, when well seasoned, that it will turn the edge of an axe and can scarcely be cut by a well-tempered saw. In burning it gives out an intense heat, and charcoal made from it is of unequaled quality.

Useful Information.

Celluloid Printing Plates.

Another new and most important application of celluloid has recently been introduced into this country in the form of celluloid printing plates. This process has already been successfully practiced on a large scale in France, where it is at present attracting considerable attention. A French inventor, M. Jannin, has succeeded in producing remarkable results in products of celluloid printing plates, both from wood engravings and from type. These are said to possess great fineness, and to be considerably more durable in service than either metal stereotypes or electrotypes. The process consists in taking a copy of the engraving on wood or of the type, with the use of a special cement, which hardens rapidly and takes the finest lines sharply. After about 20 minutes this cement is hard and resistant. The press in which this first impression is taken should be slightly heated, and a sheet of celluloid is employed to obtain a counter impression from this, which is then prepared by ordinary methods for the printing press.

M. Jannin is reported to have succeeded by his method in obtaining marvellously fine results, and is now engaged on a large scale in making celluloid reproductions of letter text, engravings of all descriptions, bas-reliefs, medals, and imitations of carvings in ivory. The work is executed very rapidly. A plate can be made within an hour, while to make a good electrotype by the usual process requires from 12 to 15 hours. A celluloid plate has been subjected to 25,000 impressions, apparently without losing any of its sharpness.

When used as a substitute for wood in the production of large printing type, it is found to be much preferable to wood. It has a fine surface, possesses great durability, can be readily worked, is light, and can stand all the rough usage of the job press.

A NEW MANUFACTURE.—A new and curious branch of the silk manufacture has lately crept into some Paterson factories. The process is a secret, and no information can be given about it, as every safeguard is maintained to prevent its getting out. The weavers themselves alone possess the secret, which is not even imparted to their employers. They work in a small room, closely locked on the inside and out, so that no one can see how the curious loom is worked. The work is said to require great skill, and only a few weavers can do it, who consequently demand and receive very large wages. Whether the thing is a success or not remains to be seen, as none of the goods have yet been placed in the market. Some of the samples that have been exhibited, however, are said to have created a decided sensation. The goods produced are nothing more or less than imitation seal skin, made of silk. It is a new process, and entirely different from the manufacture of velvet or plush, or anything of that sort, and the product is said to so closely resemble genuine seal skin of the finest quality as to deceive even experts. It is quite expensive, although of course nothing to be compared with real seal skin. The future of this branch of the silk trade remains to be seen. If the product is really what it is represented to be, it is a big thing, and will doubtless prove exceedingly profitable to those possessed of the secret of its manufacture.—*Paterson Guardian.*

GUNPOWDER WITHOUT SULPHUR seems at first rather a startling proposition. All the world over gunpowder is, and has always been, made of three ingredients—saltpeter, sulphur and charcoal—and it seems rash to attempt to do without any one of them. But experiments were made a good many years ago with sulphurless gunpowder, and the result astonished the experimenters. The old "*eprovette* mortar," which was then used to prove the quality of powder, gave as good results with the non-sulphur powder as with the ordinary kind. But the manufacture of gunpowder was at that time in a crude and unscientific state. There were no such tests for density, and so on, as now prevail; so the experimenters made their non-sulphur powder too light, and abandoned the pursuit, thinking that it was in its nature porous and weak in texture. The subject comes up again under new conditions, both of manufacture and of tests for various qualities. We understand that in England under the direction of Sir William Armstrong powder lately made without sulphur has given very good results in guns. The subject seems worth pursuing.

BLACKING BRASS.—A correspondent of the *English Mechanic* says: I have tried all the various recipes recommended—nitrate of silver, platinum bichloride, etc.—but never found any work so satisfactorily and cheaply done as by the reduction of nitrate of copper to the oxide. I find the best way of using is to apply the solution to the brass to be blacked with a camel-hair brush, previously slightly heating the metal; then to raise the heat until the requisite color is produced; finishing by rubbing with a soft rag, and either oiling or lacquering. I can confidently recommend this as the very best method of producing that good black seen in first-class optical goods, observing that the process will not do for soft-soldered articles, as the heat necessary to produce the black is greater than the melting point of soft solder.

TO CLEAN PAINT.—The following directions, says the *Manufacturer and Builder*, are simple, and will be found to answer very satisfactorily for cleaning paint on woodwork: Provide a plate with some of the best whiting, and have ready some clean warm water and a piece of flannel, which dip into the water and squeeze nearly dry; then take up as much whiting as will adhere to it, apply it to the painted surface, when a little rubbing will quickly remove any dirt or grease stains. After this wash the part well with clean water, rubbing it dry with a soft chamois. Paint thus cleaned is said to look as well as when first put on, and the operation may be tried without fear of injury to the most delicate colors. It is said to answer far better than the use of soap, and does not require more than one-half the time and labor. Another simple method is the following: Put a tablespoonful of aqua-ammonia in a quart of moderately hot water, dip in a flannel cloth and with this merely wipe over the surface of the woodwork. No rubbing is necessary. The first recipe is preferable, except where the paint is badly discolored.

PEAR WOOD.—The timber of the pear trees is of a yellow color. Gerard says the timber of the wild pear is very firm and solid, and good to be cut into molds. The platee for his "Herbal" were cut out of this wood, as were, says he, breastplates for English gentlewomen. At the present day it is much used by turners and pattern makers; the blocks with which the designs for floor cloths are painted are made from pear wood. When dyed black it can scarcely be distinguished from ebony. Handles for carpenters' tools, measuring rules, etc., are made from this wood. The wood of the pear makes excellent fuel, giving out an intense heat with a bright flame.

PACKING.—A compound of india rubber and asbestos, which is to some extent a new combination, is now used as packing for valves, its peculiar properties rendering it particularly fit for this purpose. For range valves, or high-pressure hot-water cocks, it appears invaluable. As it contains no wire it can be cut to any required size, and will stand any temperature; at present it is used most for packing steam joints and large valves.

PAPIER MACHE for dome construction seems to be now the universal idea. Two or three observatories in this country are soon to be provided with *papier mache* domes; and it is now pronounced that the dome of the Colossal Palais de Justice, Brussels, approaching completion, which was to have been of copper, shall now be constructed of papier mache. It will weigh about sixteen tons.

Good Health.

Dreams and Their Conditions.

Dreams are night thoughts, unchecked by the judgment and uncontrolled by the will. It is not true that we do not reason in dreams, that the exercise of the judgment is wholly suspended and that the will is entirely powerless or ceases to act. These faculties are not altogether in abeyance, but they doze while the subordinate powers of the mind—those which play the parts of picture carriers and record finders—ransack the treasures of memory and mingle together, in the direst confusion, old things and new. Imagination is not active, but it remains just enough awake to supply the connecting links which give seeming continuity to those parts of the phantasmagoria which we chance to remember on recovering perfect self-consciousness, and which, being remembered, we call "dreams." No one remembers more than one dream, unless he has roused from sleep more than once. This experience has led to the inference that dreams only occur at the moment or in the act of awaking. There are dreams which take place in the process of returning to consciousness—for example, those instantaneous scenes and spectacles which are suggested by the sound or feeling that rouses the dreamer; but, in result of a long and close study of the subject with a view to discover the nature of dreams and the laws of dreaming, for medical purposes, in connection with the treatment of sleeplessness, I am persuaded that dreams occur in the course of sleep and are wholly forgotten.

That they do not and cannot take place in deep sleep is probable, because deep sleep is general sleep, and when this state prevails the subordinate faculties are sleeping, and the pictures and records which compose dreams are not disturbed. To understand dreams we must understand sleep, and it is because the two phenomena have not hitherto been studied together that so little is generally known about either.—*Popular Science Monthly.*

How to Apply the Soda Remedy in Burns and Scalds.

It is now many years ago (see the London *Medical Gazette* of March, 1844) that the author of this paper, while engaged in some investigations as to the qualities and effects of the alkalies in inflammations of the skin, etc., was fortunate enough to discover that a saline lotion, or *saturated* solution of the bicarbonated soda in either plain water or camphorated water, if applied speedily, or as soon as possible, to a burned or scalded part, was most effectual in immediately relieving the acute burning pain; and, when the burn was only superficial, or not severe, removing all pain in the course of a very short time; having also the very great advantage of cleanliness, and, if applied at once, of preventing the usual consequences—a painful blistering of the skin, separation of the epidermis, and, perhaps, more or less of suppuration.

For this purpose, all that is necessary is to cut a piece of lint, or old soft rag, or even thick blotting paper, of a size sufficient to cover the burned or scalded parts, and to keep it constantly well wetted with the sodaic lotion so as to prevent its drying. By this means, it usually happens that all pain ceases in from a quarter to half an hour, or even in much less time.

When the main part of a limb, such as the hand and forearm, or the foot and leg, has been burned, it is best, when practicable, to plunge the part at once into a jug, or pail, or other convenient vessel filled with the soda lotion, and keep it there until the pain subsides; or the limb may be swathed or encircled with a surgeon's cotton bandage previously soaked in the *saturated* solution, and kept constantly wetted with it, the relief being usually immediate, provided the solution be saturated and cold.

What is now usually sold as bicarbonate of soda is what I have commonly used and recommended; although this is well known to vary much in quality, according to where it is manufactured—but it will be found to answer the purpose, although, probably, Howard's is most to be depended on, the common carbonate being too caustic. It is believed that a large proportion of medical practitioners are still unaware of the remarkable qualities of this easily-applied remedy, which recommends itself for obvious reasons.—*Popular Science Monthly.*

Action of Coffee and Sugar in Digestion.

M. Leuen makes a report before the Paris Biological Society of the effects of these articles of food, in connection with Dr. Semerie. There is great diversity of opinion on these subjects. Some, as Trousseau and Pidoux, consider coffee an excellent digestive. Others, on the contrary, consider it very injurious.

M. Leuen thus writes: He mixed 30 grams of coffee in 150 grams of water, for a dog, which is killed three hours after. The mucous membrane of the stomach is found pale, discolored and profoundly anæmic. The vessels on the internal surface, as well as those in the peripbery, are contracted. There remains 145 grams of the mixture undigested, and the stomach digestion diminished, because the contraction of the vessels, and the consequent anæmic condition of the mucous membrane, prevent the secretion of the gastric juice. The abuse of coffee will produce dyspepsia. Thus the English and the Dutch, who drink freely both of tea and coffee, are very dyspeptic. Coffee increases the cerebral functions, an effect useful, agreeable and innocuous.

Sugar has been denounced by modern chemists as a substance whose effects on dyspeptics are deplorable.

Dr. Leuen does not partake of these fears. He cites the case of a dyspeptic doctor, who for 20 years had a terror of sugar, but who now consumes 120 grams (3¾ ozs.) of sugar daily, without inconvenience. He followed similar experiments with sugar. A dog ate 80 grains of sugar with 200 of other food. Six hours afterward its stomach showed little food. The mucous lining of the stomach was red and highly congested. The congestion of the liver was notable. If one opens an animal after eating 200 grains of food and no sugar, 90 to 100 grams of food is undigested. Sugar, then, favors the secretion of the gastric juice. Coffee sweetened loses part of its defects.—*Le Medecin Practicien.*

HEALTH IN MIDDLE AGE.—At the age of 35, says a writer in the *Family Doctor*, mankind, according to some eminent authorities, is said to have reached the meridian of life, while others name 40 as the middle year of our earthly existence. But, he the case as it may, no one who has taken the ordinary means to preserve his health in youth and early manhood should feel other than young at the age of 45, from which period until that of sixty, if life be spared to us, we shall do well to consider ourselves middle-aged, and to adopt greater precautions for the preservation of health and consequent happiness, than might have been deemed necessary when youth was on our side. And if this is done, the period of middle age should be one of the greatest activity of both body and mind. What though the hairs are turning gray? That but shows one has suffered sorrow and survived it, or that, sorrow apart, he is a man who thinks. And what though the limbs he not quite so nimble? Calm enjoyments foster thought and general habits of that true temperance which conduces to long life and contentment more than anything else in this world; and whatever some may say to the contrary, I maintain that the desire to live long is inherent in every healthy sane man or woman. To die of old age is the only natural death, and if death may ever be said to be pleasant, the only pleasant one. Though younger than some of my professional brethren still in harness, I have nevertheless seen death in many shapes and forms, and in almost every case I have found the aged more resigned to the inevitable than those less advanced in years. For a well-spent life is like a well-spent day—at its close there is a wish for rest.

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Passing Events.

The past week has been the most eventful of the winter, in one respect, at least, as the abundant rains have fallen all over the State. This insures a prosperous year for California, and one of profit to both farmers and miners. With a good supply of snow stored in the mountains, the miners are assured of a good season's run.

Already the prospectors are getting ready to start out on expeditions in every direction. The newer regions will this season be most vigorously prospected, as there are many more persons now interested in the mining industry than was formerly the case. These men will scatter over the mountain ranges and hills in their search for ore, and no doubt hundreds of valuable mines will be discovered. We shall next week issue a special edition for prospectors, which they will find very useful to them.

There is no specially noteworthy event among the mines worthy of mention. The current mining news is given in our "Mining Summary" in a very condensed form, and embraces all that is going on over a wide region.

THE next party of miners to Mexico will not be sent forward from the Comstock until the first lot are heard from, which will be about 10 days hence. Mr. Deidesheimer will accompany the next party, which will probably consist of 250 men. It is said that the company which has been hiring these miners expect to have 3,000 men at work by the first of June.

Iron Pipe and California Iron.

It is stated that a syndicate has been formed in London for the purpose of purchasing the Blue Lake system of water, with the intention of furnishing this city with water. Some time ago State Mineralogist Henry G. Hanks forwarded the syndicate his annual report, giving an analysis of the "Clipper Gap" iron ore. Other information was also forwarded by Mr. Hanks, and he has received this week a letter in which the following statements occur: "Should the city accept this liberal proposition, the syndicate proposes to put up extensive iron works in the harbor of San Francisco to roll the plates for making 137 miles of iron pipe, and I am frequently called before them for information, and among other important inquiries is: Is there iron ore in the State convenient (or on the coast) for making steel, without phosphorus or other substance injurious to steel. In the work you sent you give the analysis of the Clipper Gap iron ore, which is particularly good, but as it is so situated as to be dependent on the railroad for transportation * * * it could not probably be utilized for this purpose. Will it be asking too much of you to inform me of any deposit of iron ore convenient to the bay, and also an analysis of the ore? The rolling mill would at first run the Bessemer pig iron from here, but would want, as soon as it could be economically done, to either stimulate the manufacture of pig iron by others or put up furnaces themselves. The machinery would be built strong enough to make steel rails when the contract for making the steel plates for the pipe had been completed. As I hope to induce the building of the iron works, even if the city does not take the water, I will thank you for any information you can give me that will be of interest to those considering this project. The best engineers of the country have considered the scheme and estimated the cost of putting 50,000,000 gallons per day in reservoirs provided by the city at $17,500,000. They also estimate the cost of such a plant as they would want at $1,050,000, which would have a capacity of rolling 4,000 tons per month."

The writer of the above, we should judge, does not know much about the iron industry here. We have a rolling mill in this city now, perfectly equipped. The iron works and foundries here have all the tools and appliances for doing as heavy work as is done anywhere in the world, and can do it as well.

As to manufacturing wrought iron pipe for conveying water, California can probably teach the English a good deal more than they imagine is to be learned. On this coast we deal with bodies of water under conditions not dreamed of elsewhere. Gorges are crossed with what are called inverted siphons and pipe made to stand pressure which elsewhere would be considered impossible. In short, our experience in this line has been peculiar and has been large. Wrought iron pipe for carrying water is now shipped from this city all over the coast, to the Sandwich Islands, Central America, Mexico and South America. There are several firms in San Francisco which make a specialty of manufacturing this pipe, and we are perfectly certain they would make it better and cheaper than people new to the business

As to rolling rails, the Pacific Rolling Mills, in this city, are perfectly prepared to do that. Sacramento, too, would have something to say about that branch. If the English people want to put up Bessemer works here to work up such deposits as the Clipper Gap iron, all very well. That ore, however, has to be brought a long distance by rail. Other deposits would have to be opened. But as to putting up mills simply to roll enough plates to build 137 miles of iron pipe, that is an absurdity. The pipe could be made and laid before the new mills could be got ready. As before stated, neither the English nor anyone else can tell us in California much about wrought iron pipe that we do not know already. Our experience in this direction has been wider than most people imagine.

There are many deposits of iron ore in California, but we are wofully lacking in fuel. Had coal and iron been found here in close proximity to each other, there would have been numerous furnaces working now. The foundrymen of this city would not have been content to use imported iron if it could have been produced here as cheaply; and there is plenty of capital here which would have taken hold of any enterprise with any likelihood of success. It fact the fuel question is the important one. We have to use foreign coal at our rolling mills and at our foundries. The Clipper Gap furnaces are run with charcoal, but it is not everywhere that suitable wood for charcoal is available. Then fluxes must be found, and the question of transportation comes in.

We are afraid our English friend has some visionary ideas. The practical men connected with the iron industry in this city have very thoroughly canvassed this whole question already. The statement that there are specimens of iron ore in the Mining Bureau from Napa, Sierra, Shasta, Placer, Amador, El Dorado, San Benito and other counties, conveys no information of a practical character and is apt to mislead. If there are no fluxes, no fuel, or no means of transportation, the deposits, even if good, would be of no use. There is always a lot of "general principle" talk on this subject, lacking one important element—the practical.

Institute of Engineers.

Several futile attempts have been made in this city to organize an Institute of Engineers. Two or three times the mechanical engineers have come together and tried to perfect an organization, but failed. Perhaps half a dozen or more attempts to form a society of mining engineers have also failed. It is more than probable that this non-success has been due to certain ones taking the lead who were unfitted to harmonize conflicting interests, or rather, jarring elements, and that they rather antagonized some who would otherwise have made good members. At all events, whatever the cause, we have no engineers' society of any kind in this city or on the whole coast. None of the engineers here seem to pull together, each one hanging back like a balky horse, independent of the rest. Whether professional jealousy or simple disinclination to be gregarious keeps them apart, the fact remains that they are apart. And now the young State of Colorado comes to the front with such an organization as we have been trying to have here, and it invites the co-operation of any other scientific association, journals, and those interested in scientific investigations and industries.

The Colorado Institute of Engineers has been organized by the civil, mining and mechanical engineers, chemists and metallurgists of the city of Leadville, Colorado, for the purpose of affording an exchange of scientific ideas, the professional improvement of its members, the advancement of mining industries, the fostering and encouragement of scientific research in the many fields which this country affords, the establishment of a library and reading room of technical works, periodicals, communications and original manuscripts, the collection of a mineral cabinet, and the creation of a central point of reference and union for its members.

Much care has been employed to make the initiatory steps in the formation result in the proper basis for a permanent and reliable association. The encouragement which has been given warrants the originators in saying that they believe the success of the undertaking to be fully assured.

The organization was completed on January 25, 1882, and rooms secured for the Institute in the post office building, Leadville, Colorado. The regular meetings are held at the Institute rooms on the last Wednesday evening of each month. All persons interested, visiting the city, are cordially invited to use the rooms of the Institute during their sojourn. The President is Thos. W. Jaycox and the Secretary, Frank L. Sizer. We hope before long to receive published proceedings of this young society.

Settlers.

Metallurgical settlers are of two classes, one having mullers with wooden shoes, and the other having arms with either wooden or iron shoes or stirrers. For heavy, underground sand, the muller is easier to start and less liable to clog, and is more commonly used in such cases; but for well-ground sand the other style is superior. A settler should never be allowed to foul by an accumulation of heavy matter at the bottom; it is a positive preventive of good work. It may seem easier to advocate this than always to follow it. The seeming natural remedy for such a condition is really an aggravation of it—that is, the liberal use of water. There is a point in the thinning when the quicksilver will be precipitated, but the heavy sand is held in suspension. If, after the charge is run out, which should leave about eight inches in the settler, a pan is drawn and no water added for half an hour, the warm charge will gather and carry the heavy sand; now enough water only is added to reduce it to an appearance of still some thickness, and this is all the water that is used in the charge.

THE Antimony mines belonging to Escalante & Whimple, in Sonora, which were said to have run out and were abandoned by the company which was exploring them, are found to be actually true veins, from which, up to the 20th of last month, more than a thousand tons of metal have been extracted. Equally so with respect to the other mines of the district of Altar and Magdalena that are being actually worked, continue to produce good ore, offering great hopes for the future.

THE Horn Silver mining company, Utah, during the year 1881, produced 16,341,995 pounds of lead and 1,259,903 ounces of silver. A careful estimate, by one of the very best miners on the coast, who is familiar with every detail of the mine, based upon past surveys and measurements, compared with later explorations, places the amount of ore in sight at over $50,000,000.

THE Belcher, Crown Point and Imperial companies, Gold Hill, have given orders to hoist out all tools, air-pipe, car-track, and other apparatus and machinery from points below the level of the Sutro tunnel. This, of course, shuts down the lower levels. The Crown Point and Belcher companies will, however, continue the extraction of low grade ore from the upper levels.

On Minerals.

[Notes of a Lecture delivered before the Mechanics' Institute by A. W. JACKSON, Jr., Instructor of Mineralogy, Petrography and Economic Geology, at the University of California.]

(Continued from Last Week)

Metallites.

Under this general head we comprise all of the insoluble and incombustible minerals that contain a heavy metal as an essential ingredient. This includes all substances ordinarily called ores. A more exact discussion of what an ore is will come later, in my lecture on ores; suffice for the present that an ore is any mineral from which a metal can be profitably extracted. Now, while this class contains about 360 minerals, only about 50 of them are actually available as ores at the present time. The rest either occur in too small quantity (some, indeed, are extremely rarely met with), or are incapable of profitable reduction.

We subdivide into the four orders indicated in the table.

Halometallilis.

This order comprises the combinations of the heavy metals with acid such as—

Silicic,
Sulphuric,
Carbonic,
Phosphoric,
Chlorhydric, etc.

Among the 168 minerals which constitute the order, are some of the rarest and most beautiful known to the science. As a group, they present much livelier and more beautiful colors than the preceding minerals, and with this further difference, that the colors are mostly quite characteristic, the mineral occurring with but one color instead of a dozen or more, as with many of the preceding minerals. The luster is common (stony), but generally very brilliant. They nearly all occur in exquisite crystals, with every conceivable variety of form and grouping. The mode of occurrence is quite characteristic for most of them. They are found in the upper portions of ore deposits.

To glance hastily at some of the individual minerals, we pass by at once quite a number containing the rare elements niobium, tantalum, cerium, etc. Calamine and Smithsonite are the chief sources of zinc. Hornsilver is a very valuable ore of silver, but every old miner knows how it disappears as soon as depth is attained.

Cerussite,
Anglesite,
Wulfenite,
Pigromorphite,
Vanadinite,

Do not figure much as ores of lead, because the sulphide is too plentiful. Naturally, a very large number of iron salts are known; iron itself is such a common element that we find it in combination with almost every acid with which it will form an insoluble compound. Thus we have a large number of silicates, sulphates, phosphates, arsenates and carbonates, of all of which only the latter is of great economic value.

Siderite, in the form of clay, ironstone, occurs differently from the mode indicated above. It occurs in widely extended horizontal deposits, interbedded with coal; so that frequently both coal and iron ore are hoisted through one and the same shaft. It may be said, without exaggeration, that England owes much of her successful material development to this fortunate intimate association of two of the greatest factors of modern civilization, coal and iron. In many of the coal fields of this country, in Pennsylvania, Ohio and the West, this same intimate association is met with, and must furnish the basis of the most enduring prosperity to those favored sections.

Copper has some important ores in this group, particularly the two carbonates, malachite and azurite; the one an exquisite emerald green, and the other on equally beautiful blue. You are all more or less familiar with the former, worked up into the form of vases, table slabs, mosaic and other ornamental work. Nickel, cobalt, manganese and uranium also occur in salts, but the minerals are rarely met with.

Metal Oxides.

The metal oxides are simply combinations of a heavy metal with oxygen, partly hydrated, partly anhydrous.

We meet in this family for the first time minerals with strong *metallic luster*, as in the oxides of manganese, magnetic oxide of iron, and specular iron, while on the other hand, *most* of the oxides have a common lustre, and a considerable variety of color.

The geological occurrence is extremely various, so that nothing of a general nature can be said of them. The oxides of iron (magnetite, specular iron, hematite, and limonite), of manganese, pyrolusite, of tin, cassiterite, also chromite, zincite and cuprite all form extensive ore bodies and are mined in large quantity.

California contains large amounts of Chrome-iron, confined mostly to the coast range. It is all sent East in the raw state. The occurrence of one of these oxides of iron as the universal red, yellow and brown coloring agent of soils also deserves mention. Iron, either in the form of magnetic oxide or combined with a silicate, occurs in nearly all rocks whose decomposition produces soils; and the iron invariably finds itself ultimately in the form of insoluble brown, yellow, or red, hydrated oxides, which are almost universally disseminated.

Some Suggestions as to the Formation of a Mining Association.

In a communication to the MINING AND SCIENTIFIC PRESS, (published December 31st, 1881), on the "Hydraulic Mining Question," certain facts were presented for for consideration concerning the importance of the hydraulic mining industry and the probable results of its enforced abandonment. Hydraulic mining is only one branch, though the most important one, of the California mining industries. Drift mining of the auriferous gravel banks, either as an auxiliary to the hydraulic mining of the same deposits, or independent of it in gravels that cannot be profitably worked by hydraulicing, employs a large amount of capital and labor and adds considerably to the total annual gold product of California. Quartz Mining and milling also employs directly and indirectly a still larger amount of capital, and are the support of a large population.

In the suits now on trial in Sacramento, and in the unreasoning feeling aroused in the purely agricultural regions of the State, which threaten the very existence of hydraulic mining, can be seen the germs of a movement to destroy or greatly cripple the entire mining industry. This is not yet openly avowed, in fact, would probably be denied, but granting for the moment that the fight against hydraulic mining is successful, and it be either entirely stopped or subjected to such conditions as to make it unprofitable, how long will it be before drift mining is attacked? Unquestionably, the same law and evidence that will operate against one will work against the other. Drift mining is gravel working on a very small scale, yet the aggregate of debris discharged into the rivers is very large. Some single drift mines wash from 50,000 to 100,000 cubic yards annually, and it is probable that the drift mines on the Middle Fork of the American river run yearly nearly as much gravel as the hydraulic mines tailing into it. In what way quartz mining can be attacked is not so clear; it would be a far-fetched course of reasoning that would claim direct damage to valley farming land from it, yet so sympathetic is all mining enterprise to an attack on one branch, that it would doubtless be greatly injured.

That sand and gravel will be taken up by the rivers in the mountains, and carried by them to the valleys to be there deposited, is undeniable. The rivers certainly won't transport sand and gravel the other way, and unquestionably the hydraulic and other mining done in the mountains furnishes the rivers with a large proportion of the material with which they fertilize the valley lands. The present mining is not, however, responsible for all the damage claimed to have been done by the river deposits; the placer mining of 20 and 30 years ago is even more a factor in filling the river channels with sands and gravels, which every winter's high water washes over the low banks and leaves on the land.

The issue has been very squarely put by the farmers and must be met as squarely by the miners. No mere words can disprove the fact of overflowed debris-covered farms, for which hydraulic mining has a partial responsibility. Nor will mere words or theoretical discussions of the value of slickens as a fertilizer for bottom lands compensate the farmer for the practical destruction of his means of support. Whether the debris can be held back in the mountain canyons and prevented from spreading over the valleys is entirely an engineering problem, but admitting as most probable that it can be successfully solved, it will not afford immediate relief and is therefore only a part, though an important part, in a general, comprehensive scheme of action on the part of the miners. It should also be realized that any plan of action depends, both for inception and carrying out, on the miners, unaided by any other interest, probably with all other interests and whatever political power they can wield opposed, and unpalatable as it is, the opposing elements represent the greater political power.

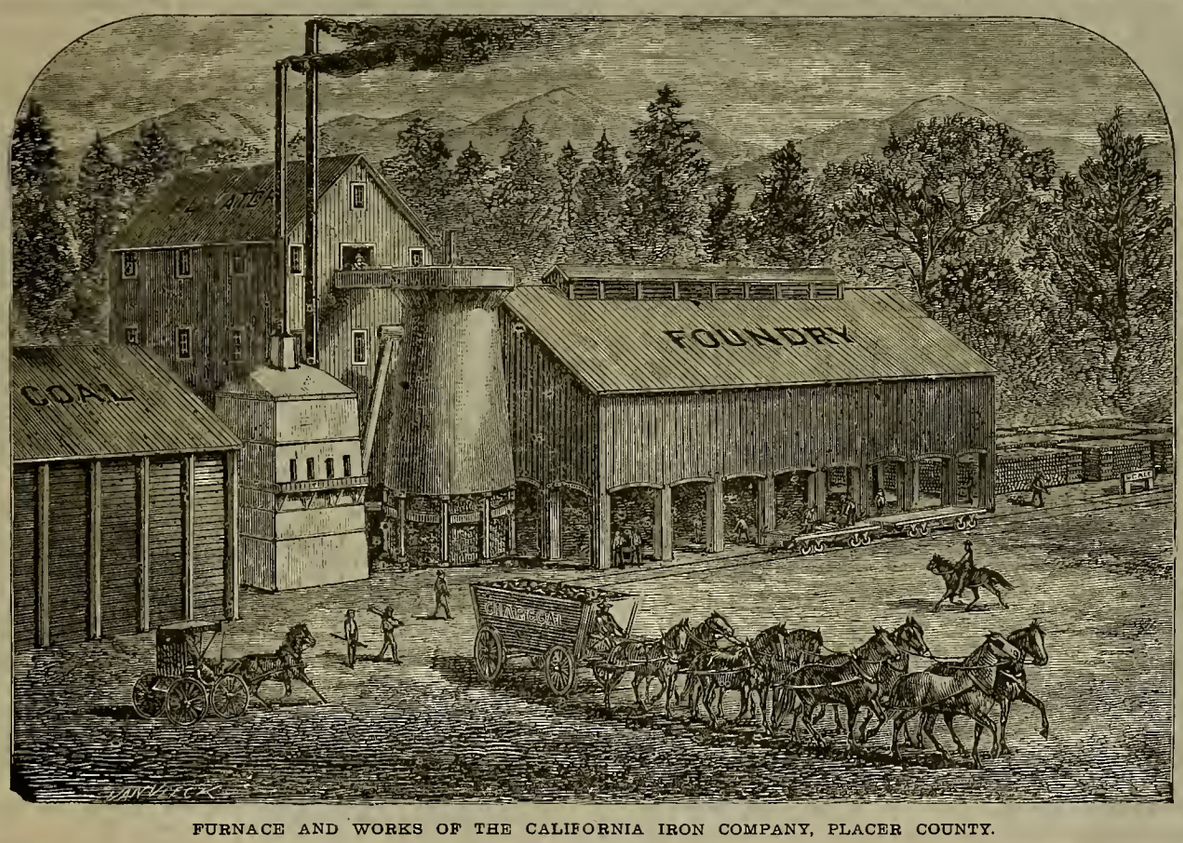
The suggestions, or rather plan, I have to offer by those more familiar with the problem to be solved may be deemed impossible of practical application, but it is at least pertinent in view of the miners' meeting soon to be called, and possibly may have the plea of novelty. It, if considered practicable and adopted, would go far toward ending the present agitation by restoring confidence between the two great industrial interests of the State. Its practical operation would tend to prevent a recurrence of the causes leading to the present trouble, and incidentally mining would be placed on a firmer basis, and relieved of much of its necessarily speculative character.

Briefly stated, the plan is about as follows: Let a miners' association be formed that will admit all mine owners, whatever the nature of the mining they are engaged in, and ditch owners in the mining counties. As the basis of association, let each mine owner, or owners, and ditch owners, list their mining property to the association at their own valuation, the right to membership to be vested in and to pass with the title to the property so listed, such valuation to be the measure of representation in the councils of the association, and for the assessment of the general dues for the support of the association. The control of all general and executive business to be placed in an elective board of directors. In addition to the board of directors, let there be two other elective boards, independent of the board of directors, and of each other. The first to be known as the Board of Condemners, whose business it shall be to visit the districts affected by the debris from the mountain streams, and ascertain a fair valuation for the injured property. The board of directors shall, on the report of the board of condemners, be empowered to purchase the condemned property at a price not in excess of the valuation decided on by the Board of Condemners, the title to all such acquired property to vest primarily in the Association, as trustee for the mines and mining property assessed for its purchase, ownership to be in proportion to the amount of tax paid. The third board to be known as the Board of Assessors, whose duty it shall be to determine annually the proper valuation for all mining property listed to the association, as a basis for a tax to be levied by the board of directors to secure funds for the purchase of condemned lands and for such general engineering works as may be practicable for holding the debris in the mountain canyons, and for leveeing and improving the purchased valley lands. Also, this board should determine the ratio of tax for which each piece of property is liable. The general funds and dues—these taxes noted being special funds—would be used for the payment of salaries and the defense of such suits as that now on trial in Sacramento.

As an auxiliary to the association let some of our rich mining capitalists establish a strong mining bank, in which the association and individual miners could deposit their funds. Then let the bank confine itself to an exclusively mining business, dealing in and making loans only on mining property. Such an institution would greatly strengthen the mining interests of the State, and be a financial success, backed up by such an association as proposed.

Naturally enough there are defects in this plan of operations, which would be certain to some extent to militate against its practical success. Most of these defects are, however, due to the nature of the problem dealt with, and are of necessity inherent in any plan that may be proposed. Large amounts of money would be required, but could be raised in the method indicated without crippling the industry, as would be the case if no action is taken and adverse litigation is successful.

The Spring Valley hydraulic mine has successfully put in operation a portion of the details of the plan I have proposed. In the MINING AND SCIENTIFIC PRESS of Dec. 31st, 1881, will be found a long article descriptive of the mine and the method the owners took to solve the slickens problem. Briefly summarized, during the ten years from 1870 to 1880; $395,196 were expended in the purchase of 6,000 acres of land subject to damage from the mine debris, and $154,708 for levees and other improvements, giving practical control of all the tailings from the mine. The total expended in this way was $549 904, about 20% of the gross yield of the mine. During the same period, $465,000 were paid in dividends. During eighteen months of 1880 and 1881, $21,400 have been expended for levees, etc.; $50,000 disbursed in dividends, and about $240,000 in wages and mine expenses. There has been no slickens litigation, nor is any probable



FURNACE AND WORKS OF THE CALIFORNIA IRON COMPANY, PLACER COUNTY.

Lime Instead of Powder in Mines.

For breaking down or getting coal or other minerals in mines and quarries, Messrs. Smith and Moore propose to use caustic lime, introduced into bore-holes in the said minerals, and then brought into contact in a confined condition with water, so that by the expansion of the lime in becoming slaked, and by the pressure of steam generated, considerable force is produced, sufficient to effect the breaking down of the mineral. By this means, in the case of coal mines, the double advantage is gained of effecting the breaking down of the coal without danger of explosion of fire-damp, and with the production of a greatly reduced proportion of small coal as compared with the ordinary blasting operation. Their invention may be carried into practice in a variety of ways, but according to the arrangement and mode of operating they employ, by preference, the caustic lime is ground fine, and then consolidated by pressure into cartridge form, each cartridge having a groove on the side, which cartridges are inclosed in waterproof casings to protect them from damp. A solid rod or needle is first inserted into the bore hole; the cartridges are then introduced, the surface of the groove being next to the needle, and they are rammed home to insure their filling the bore-hole. After the cartridge or cartridges have been inclosed, either by tamping with clay or other suitable material, or by a bung or otherwise, the needle is withdrawn, and a tube is inserted in its place, which tube is fitted with a tap or automatic check-valve, or other means of closing it. Through this tube the water is conveyed to the lime by a force-pump, or other power; when the water has been enforced in, the pipe connecting the pump or other power with the said tube is detached, and the tube is closed, so as to prevent the escape of the steam generated by the action of the water on the lime.

In order to cause the whole mass of the cartridge or cartridges to be subjected more or less simultaneously to the action of the water so as to bring about a rapid and energetic action, the cartridges may have a groove, as before mentioned, formed along its side, or a hole through its center, into the front end of which groove or hole the said tube for conveying the water is made to enter, so that the water is forced in along the whole length of the cartridge or cartridges. Or, the tube itself may be made to extend along the whole length of the cartridge or cartridges, and be provided with perforations or slits through which the water can issue. The lime they prefer to use is made from mountain limestone. Although they prefer to employ the lime in the form of consolidated cartridges, as described, yet it may also be rammed into the bore-holes in an unprepared condition, the tube for conveying the water being first introduced into the bore-hole at the side or center thereof; or a solid rod or "needle" may be introduced in the first instance, as aforesaid, and after withdrawing the same the tube for the water supply is inserted in its place. If desired, other fluids, such as diluted sulphuric acid, may be employed, or the water may be used hot to accelerate the expansive action of the lime, and other substances may be mixed with the lime for the same purpose.

Russell L. Dunn.

Auburn, Jan. 24, 1882.

The California Iron Works.

The engraving on this page is a representation of the plant of the California Iron and Steel Company at Hotsling, Placer county. This is the first step towards utilizing the iron ore deposits of this State. In course of time a rolling mill will be the result. We shall in the next number of the PRESS give a detailed description of these works and of the proposed operations of the company.

EXTRA EDITION.—The next number of the MINING AND SCIENTIFIC PRESS will consist of 24 pages, and will be devoted to the interests of "Prospectors." We have compiled and collected a great deal of information valuable to this class of the mining community, and the PRESS of next week will be useful for reference to others as well.

READERS who preserve files of the PRESS for reference, will please observe that, owing to a mistake in numbering the folios, an error of 20 pages occurs. The second page of this issue should have been 170, the third 171, the sixth 174, and the seventh 175.

AN earthquake in Costa Rica destroyed the towns of Alajuela, San Ramon, Greca and Hereda, and several thousand lives were lost.

EXTENSIVE coal fields are being discovered in the districts of Arispe and Montezuma, Sonora. The fields are many leagues in extent and the coal is of superior quality. The State Government of Sonora has issued concessions to two parties for the exploration of the fields.

THE delinquent list of the California M. Co. is the largest ever published on the Pacific coast. About 10,000 certificates are advertised.

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CONSIDERABLE placer ground has been staked off in Rio Arriba county, N. M.

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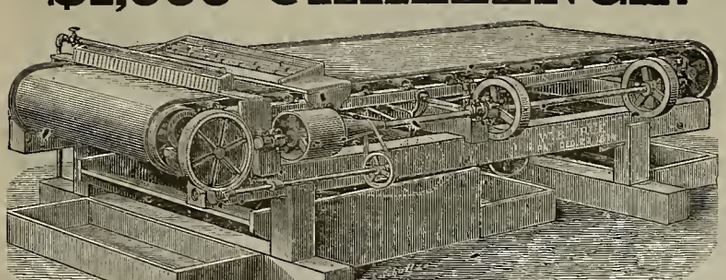

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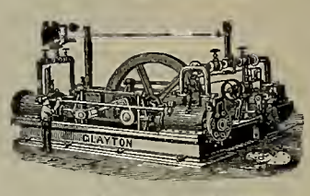

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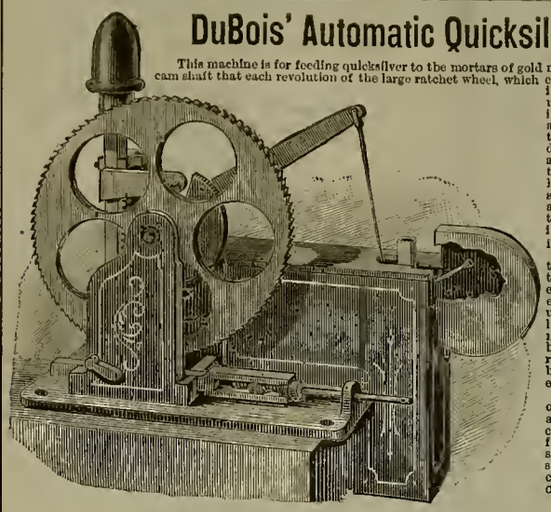

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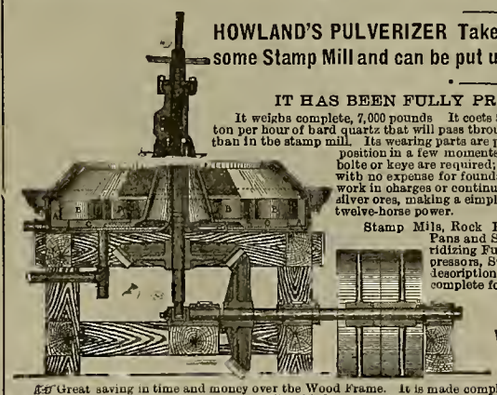

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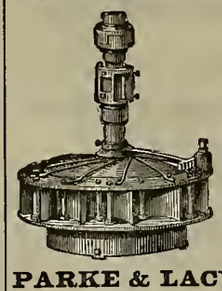

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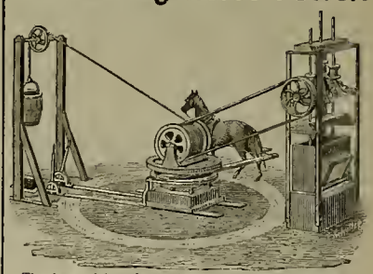
BARTLING & KIMBALL,
BOOKBINDERS,
Paper Rulers & Blank Book Manufacturers
505 Clay Street, (Southwest corner Sansome),
SAN FRANCISCO

JOHN A. CHURCH, E. M. PH. D.
MINING ENGINEER,
Room 75, 115 Broadway, New York.
☞Agent for PADDOCK'S Ore Dressing Machinery. Mining Machinery supplied.

San Francisco Cordage Factory.
Established 1856.
Constantly on hand a full assortment of Manilla Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
Extra sizes and lengths made to order on short notice
TUBBS & CO.,
611 and 613 Front Street, San Francisco

New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
C. H. BAKER,
Agent and Manufacturer of Mining Machinery
38 and 40 Main St., S. F.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

Palmer's Safety Clutch
FOR
ELEVATORS
Will be Applied to Elevators on Short Notice.
☞It is now used in the U. S. Army Building and Grand Hotel, New Montgomery Street.
Agency, 303 Montgomery St., S. F.

Vigorit Powder.

The California Vigorit Powder Company, of this city, has issued a pamphlet containing a report on the powder, by W. R. Quinan, Fourth Artillery, U. S. A., from which we make some extracts, premising that perusal of the complete report (which may he had by addressing the company at 327 Pine street, S. F.) will enable many to learn considerable about the nature of nitro-glycerin compounds.

Mr. Quinan has considerable to say on the several features of nitro-glycerin powders, and powder manufacture generally, and also gives the results of tests made by him. He says:

"Even a properly compounded powder, if not perfectly detonated, will produce noxious gases. Nitro-glycerin itself, if not properly detonated, will produce noxious gases. The noxious gases formed by certain nitro-glycerin powdere are oxides of nitrogen, which affect respiration, and carbonic oxide, which is a deadly poison. But neither is formed when the oxygen is in proper proportion to the other elements, and the powder is susceptible to perfect detonation under the particular circumstances. This freedom from noxious gases was one of the original claims of the old Vigorit powder, and on good grounds. So susceptible is the powder to the action of the fulminate, that even unconfined, lying on the surface of an iron plate, its detonation is perfect, and under these conditions it will show greater strength than a really stronger powder, in which a perfect detonation can only be effected under strong confinement."

Guided by theee theories, and deductions from practical experiment, I have been led to adopt the following formulas for the composition of the different grades of Vigorit powder as best fulfilling the qualities sought for. * * *

The theory of the explosion of the powder may be expreesed in chemical symbols as follows: * * *

The gases formed, as shown by this reaction, are harmless, and those helonging to a perfect detonation. Expcrience hae confirmed this theory.

The old powder has heen in the market some five years. If the operations of the company had not heen crippled during a good part of that time hy a lawsuit, I helieve that its powder would have before this estahlished a wide reputation for safety and reliability. As it is, we have yet to hear of a single human being who has heen injured hy it.

In the new powder, the principle of the old has been preserved. Its general features, as compared with the older powders in the market, are that it containe less nitro-glycerin which is combined with more resilient materials.

A concentration of power is characteristic of high explosives. The denser the powder, other things being equal, the greater this concentration, and the more advantageous its use, since smaller holes will euffice to hold the quantity required for a given work. Though Vigorit is not the densest powder in the market, its safety against tamping admits of its heing thoroughly compacted in the bore-hole, so as to get great concentration.

In concluding his report and summing up his facts, Mr. Quinan says:

I think tnat the powder now made by your company is the hest in the market, because it possesses more of the qualities desirable in a blasting powder than any other. Its characteristics may be summed up as follows:

First—It is one of the strongest, and its strength ie more uniform than any other, from the nature of the absorhents and the thorough incorporation of the ingredients. This can be shown hy successive tests in the pressure gauge. Neither does the strength vary from hygrometric changes of the atmosphere.

Second—It is safe against spontaneoue decomposition. The nitro-glycerin is made from the hest materials, and is thoroughly purified before being put into the powder.

Third—It does not leak. Ie contains less nitro-glycerin, and this is better absorbed than in most powders. It does not lose strength in this way, and there is no exuding nitro-glycerin to render its transportation and handling perilous.

Fourth—It is not deliquescent, and can be used in wet holes as well as dry. It can he stored in damp places without spoiling. It does not undergo sudden changes of character in regard to sensitiveness, leading to accidents in its use.

Fifth—It ie safe against fire, friction, and the shocks and jars of use.

Sixth—It is resilient and elastic, and can be tamped with perfect eafety so as to get any desired degree of condensation in the hore-hole.

Seventh—It loses less in strength from freezing than any other nitro-glycerin powder, hecause it is less dependent upon the nitro-glycerin.

Eighth—It is more efficient than most other powders under slight confinement, because it is susceptible to detonation by the cap.

Ninth—When exploded there is no fine dust or poisonous matter scattered through the atmosphere to be inhaled into the miner's lungs, to his discomfort or detriment,

Tenth—The gases produced hy explosion are innoxious. Most of the visible smoke is condensed aqueous vapor, which requires hut a few moments to dissipate. The poisonous carbonic oxide and irritating, throat-rasping oxides of nitrogen, are avoided by properly proportioning the oxygen to the other chemical elemente, and by making the powder susceptihle to perfect detonation by the cap.

Pleasure in Recommending, Etc.

OAKDALE, Stanislaus Co., Cal., March 6, 1882.

Messrs. Dewey & Co.—DEAR SIRS:—I hereby acknowledge receipt of patent with copies, for which please accept my sincere thanks. I shall take pleasure in recommending your agency when I have an opportunity.

Yours Truly, J. M. NELSON.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send nons but worthy men.

O. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
B. W. CROWELL, San Benito and Monterey counties.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F. D., at this office.

A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central systemin San Francisco.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

Cylinder Printing Press for Sale.

A large cylinder Hoe printing press, for country newspaper work, can be bought cheap by addressing

PRESS, BOX 2361, S. F.

Business Offices and Sunny Rooms to Let.

We have some desirable rooms to let adjoining the offices of this paper which will be rented on favorable terms. Stair entrances, No. 252 Market St. Elevator, No. 12 Front St. Parties wishing offices, etc., will do well to call and see them. DEWEY & CO.

ANNUAL STATISTICIAN of 1882.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 816 California st. Price, $4.

San Francisco Metal Market.

[WHOLESALE.
THURSDAY, March 2, 1881.

IRON.—	
American, Pig, soft, ton	— — @35 00
Scotch, Pig, ton	25 50 @27 50
American White Pig, ton	— — @— —
Oregon Pig, ton	— — @33 00
Clipper Gap, No. 1	— — @33 00
Clipper Gap, White	— — @34 00
Clipper Gap Car Wheel	— — @35 00
Refined Bar	4 @
Horse Shoes, keg	— @ 5 50
Nail Rod	— @ 7½
Norway, according to thickness	6½@ 70
STEEL.—	
English Cast, lb	13 @ 15
Black Diamond, ordinary sizes	13 @ 16
Drill	15 @ 16
Flat Bar	16 @ 18
COPPER.—	
Ingot	— @ 22
Sheet	— @ 20
Sheating, Tinned 14x18	— @ 31
Nails	— @ 17
Bolts	— @ 33
Old	— @ —
Bar	— @ 22
Cement, 100 fine	— @ 15½
LEAD —	
Pig	— @ 5
Bar	— @ 8
Pipe	— @ 8
Sheet	— @ 9
Shot, discount 10% on 500 Bags	
Drop, per bag	— @ 2 10
Buck, "	— @ 2 30
Chilled "	— @ 2 50
TIN PLATES.—	
10x14 I C Charcoal	7 00 @ 8 00
10x14 I C Coke	6 25 @ 6 50
Banca Tin	— @22 50
Australian	— @23 50
I. C. Charcoal Roofing 14x20	— @ 6 50
ZINC.—	
By the Cask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @ 10
NAILS.—	
Assorted Sizes	4 00 @ 4 15
QUICKSILVER.—	
By the flask	@36½ 36½
Flasks, new	— — @ 1 25
Flasks, old	— — @ 1 05

Mining and Other Companies.

Persone intereeted in incorporatione will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

San Francisco, March, 10, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, dividend No. 61, of Fifty cents (50c) per share, was declared payable on Wednesday, March 15, 1882. Transfer books closed on Saturday, March 11, 1882, at 3 o'clock P. M.

WM. WILLIS, Sec'y.

Office—Room No. 29, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, March 2, 1882.

At a meeting of the Board of Directors of this above named Company, hald this day, dividend No. 39, of seventy-five cents (75c) per share was declared, payable on Monday, March 13, 1882, at the office in this city, or at the Farmers' Loan and Trust Company, in New York.

WM. WILLIS, Secretary.

Office, room No. 29 Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company,

San Francisco, March 7, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 27), of Twenty-five Cents (25c) per share was declared, payable Wednesday, March 15th, 1882, at the office of the Company, room 19, No. 328 Montgomery Street, San Francisco, Cal. Transfer books will be closed on March 11, 1882 at 1 P. M. JOSEPH NASH, Sec'y.

Carson and Colorado Railroad.

(NARROW-GUAGE.)

The Company announce the completion of its line March 1, 1882, to CANDELARIA, Columbus Mining District, Esmeralda Co., Nev., 138 miles from Mound House (Junction with Virginia and Truckee Railroad).

STAGE CONNECTIONS,

At Hawthorne with U. S. Stage Company's daily coaches for Aurora (25 m.); Bodie (37 m.); Lundy and Bridgeport.

At Luning (125 miles from Mound House) with Gilmer, Salisbury & Co.'s tri-weekly stages (leaving Tuesday, Thursday and Saturday mornings) for Grantsville, Belmont and Tybo.

At Belleville (150 miles from Mound House) with Belleville and Independence Stage Co.'s stages for Benton (40 m.), Bishop Creek, Big Pine and Independence.

At Candelaria, with U. S. Stage Co.'s stages for Columbus (8 m.), Silver Peak, Montezuma, Alida Valley, Gold Mountain, etc.

THROUGH TICKETS

To the above points for sale at San Francisco, Sacramento Reno, Carson and Virginia R. R. Ticket offices.

This is the direct and natural route for Passengers and Freight, to points in Southern Nevada, Mono and Inyo counties, California. The line laid with steel rails and red wood ties and equipped with new and first-class rolling stock is penetrating new and most promising Mining Districts which are now attracting deserved attention throughout the country.

For information on through freight rates apply to

H. M. YERINGTON, Gen'l Supt. D. A. BENDER, Gen'l Freight & Pass. Agent. Carson, Nev.

E. BUETTNER, C. E.

Mining Engineer.

MINING PROPERTIES EXAMINED AND REPORTED ON

FRISCO, BEAVER COUNTY, UTAH.

EDWARD BOOTH,

Chemist and Assayer,

No. 110 Sutter St., S. F.

The Explorers' Miners' and Metallurgists' Companion.

Comprising a Practical Exposition of the Various Departments of Exploration, Mining, Engineering, Assaying, and Metallurgy,

Containing 672 Pagee and 83 Engravings,

BY J. S. PHILLIPS, M. E.,

Of California, a Practical Operator for Thirty-eight Years; Explorer and Resident in the Pacific States and Territories for the past Twelve years.

PRICE—bound in cloth, $10.50; in leather, $12.

For sale at this office.

COAL AND IRON.

1,000 TONS LEHIGH LUMP AND EGG—Ex Gov. Goodwin, Tacoma, Prussia.

500 TONS NO. 1 GLENGARNOCK AND EGLINTON PIG IRON—Ex Loch Mordart, Z. Ring, and Ben Douran.

1,000 TONS COWPER WEST HARTLEY, Ex Prince Frederick.

ALSO, IN STOCK,

CUMBERLAND COAL,

In bulk, sacks and casks.

Sydney, Scotch Splint, Cannel, Patent Coke and Welsh Steam Coal.

Clay Lane and Sterling White Iron.

For sale in lots to suit, at Lowest Market Rates.

J. MACDONOUGH,

No. 41 Market Street, San Francisco, Cal.

NEW YORK REFINING CO'S

Standard Lubricants,

CYLINDER AND MACHINE OILS.

Standard Axle Grease and Carriage Lubricant, for Light Axles, Harness, or any Leather.

In Stock a Full Supply of

SHEET, CAST BRASS AND SHEET ZINC CUPS.

Price of Standard Lubricant, 40 cents per lb. Subject to Discount for Quantities.

Put up in 5 lb., 10 lb., 30 lb., and 50 lb., tin Cans.

Boxed in any quantities desired. Also, in Barrels and Half Barrels.

E. B. READ, Sole Agent, 419 California Street, S. F.

MECHANICS' MILLS.

OUR WELL KNOWN

WATER TANKS,

Made by machinery. Best materials in use. Every piece numbered. No skill required in setting up. Shipped to all parts of the coast. PAN STAVES, WOOD PULLIES and BATTERY GUIDES a specialty.

WELLS, RUSSELL & CO.,

Mechanics Mills, corner Mission and Fremont street.

LUTHER WAGONER. JOHN HAYS HAMMOND.

WAGONER & HAMMOND,

Mining Engineers,

318 PINE ST., SAN FRANCISCO.

Especial attention given to the examination and reports upon all kinds of mining properties.

OUR MOTTO IS:

Accuracy, Dispatch and Reasonable Charges.

Rare Cabinet of Minerals.

A physician who has long resided in the mines and other parts of California, and gathered a large and valuable collection of minerals and other specimens, offers the same for sale at a bargain. Address "Cabinet," box 2361, San Francisco.

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Wine Cooperage Co.

FULDA BROS., Proprietors.

30 to 40 Spear St., S. F.

ALL KINDS OF CASKS, TANKS, ETC.

Ship, Mining and Water Tanks a Specialty.

The undersigned are agents for, and are prepared to furnish prices and all particulars for

THE BALDWIN LOCOMOTIVES, every style and for any service.

THE BALDWIN STEAM MOTOR for use on City and Suburban Roads.

FREIGHT CARS, PASSENGER CARS, STREET CARS, From BILLEMEYER & SMALL CO., and J. M. JONES & CO.

CAR WHEELS. from A. Whitney & Sons.

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202 Market Street, San Francieco

BOONE & MILLER,

Attorneys & Counsellors-at-Law,

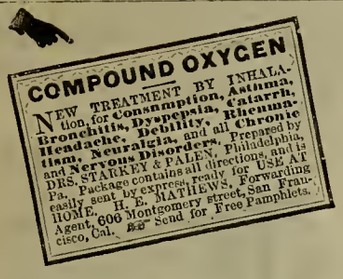
Rooms 7, 8 and 9

No. 320 California Street, S. F.,

(Over Wells Fargo & Co.'s Bank)

Special Attention Paid to Patent Law.

N. B.—Mr. J. L. Boone, of the above firm, has been connected with the patent business for over 15 years, and devotes himself almost exclusively to patent litigation and kindred branches.


COMPOUND OXYGEN
NEW TREATMENT BY INHALATION, for Consumption, Asthma, Bronchitis, Dyspepsia, Rheumatism, Neuralgia, Debility, Chronic Headache, and all Chronic and Nervous Disorders. Prepared by DRS. STARKEY & PALEN, Philadelphia, Pa. Package contains all directions, and is easily sent by express; ready for USE AT HOME. H. E. MATHEWS, Forwarding Agent, 606 Montgomery street, San Francisco, Cal. Send for Free Pamphlets.

J. H. WYTHE, M. D.

Residence: 985 West Street, Oakland. Before 10 A. M., after 5 P. M.

Office: 759 Market St., San Francisco From 11 A. M. to 3 P. M.

"THE $1,000 CHALLENGE"

Ore Feeder for Quartz Mills.

OVER 800 ARE NOW IN USE, GIVING ENTIRE SATISFACTION.

Awarded First Premium at the Tenth and Twelfth Industrial Fairs of the Mechanics' Institute.

Twenty Per Cent. More Ore Crushed with Fifteen Per Cent. Less Wear of Iron than by Hand Feeding.

The accompanying cut illustrates the recently introduced Grip, and also the Spring Attachment, which replaces the Weight heretofore used, and which are obvious improvements.

It is now fully demonstrated, after careful and long continued experimentation and practical use, that the plan upon which a perfect Ore Feeder must be constructed is that of a carrier, and not that of a shaking table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Jerky or spasmodic contrivances will not answer the purpose for wet or sticky ores

The Challenge Ore Feeders are now in Use in the following Mills, besides many others

Soulsby	20	Stamp	Tuolumne county, Cal.
Sheep Ranch	20	"	Calaveras " "
Mahoney	40	"	Amador " "
Zaile	40	"	" " "
Placerville	40	"	El Dorado " "
Gross	80	"	" " "
Julian	20	"	Placer " "
St. Patrick	15	"	" " "
Providence	20	"	Nevada " "
Omaha	10	"	" " "
Green Mountain	60	"	Pinmas " "
Pinmas Eureka	60	"	" " "
Bulwer-Standard	30	"	Bodie Dis., Mono, "
Standard	20	"	" " "
Noonday	30	"	" " "
Bodie	10	"	" " "
Christy	5	"	Uintah Co., Utah.
Ontario	40	"	Parley's Park, "
Contention	20	"	TombstoneDis, Arizona
Grand Central	20	"	" "
Harshaw	20	"	Patagonia, "
Sunshine	20	"	Idaho Springs, Col.
Homestake	240	"	Black Hills, Dakota.
Father De Smet	80	"	" "
Hidden Treasure	40	"	" "

Superiority of the "Challenge" Ore Feeder Demonstrated!

At the "Christy" Mill, Uintah County, Utah, the "Eclipse" Feeders, (conceived by E. Coleman) were introduced, but not carrying a regular supply of ore for the crushing capacity of the stamps, were replaced by the "Challenge," which are now running and the stamps crushing forty (40) per cent. more ore than was done by the "Eclipse."

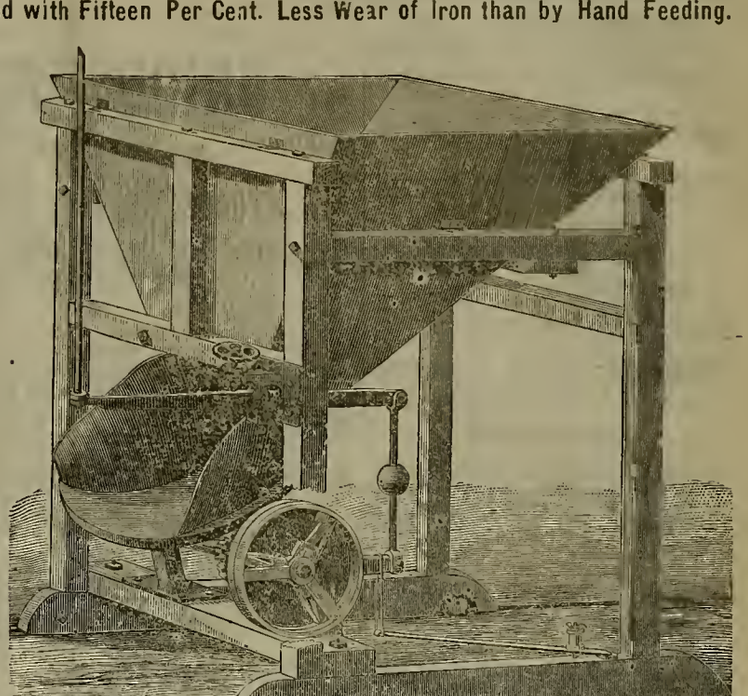
The "Harshaw" or "Hermosa" Mill, of Patagonia District, Arizona, was also originally fitted with "Eclipse" Feeders, but after a few weeks trial they were pronounced inadequate to the work, discarded, and the "Challenge" adopted

The "Silver King," Mill of Arizona, also removed the "Eclipse" Feeders to give place to the "Challenge."

The "Sola" Mill, of Brown's Valley, Yuba County, Cal., was fitted with "Victor" Feeders, manufactured by E. T. Steen, but proving insufficient, the "Challenge" Feeders were substituted.

Four of the "Victor" Feeders, manufactured by E. T. Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.

These cases are simply cited from among many similar instances, in proof of the vast superiority of the "Challenge" Feeders over all others.



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Machine Works, 49 and 51 Fremont Street, San Francisco.

Manufacturer of Quartz, Saw Mill and General Machinery. Also Agent for BAKER ROTARY PRESSURE BLOWERS, and WILBRAHAM ROTARY PISTON PUMPS. P. BLAISDELL & CO.'S Machinists' Tools. HOT POLISHED SHAFTING from the Akron Iron Company, of Akron, Ohio.

Dealer in New and Second Hand Engines, Boilers, and all Descriptions of Machinery.

Send for Circulars.

VIGORIT POWDER.

NO ACCIDENT HAS EVER HAPPENED.

ALL POWDERS manufactured by the California Vigorit Powder Co. are SUBMITTED during the course of manufacture TO SCIENTIFIC and accurate TESTS for safety and strength.

They are tested for Safety against Friction, Fire, a Temperature of 212° Fahr., and the various shocks to which Powder is liable in practical handling.

The following qualities are common to all grades of Powder manufactured by the Company:

Safety; Non-Leakage; Freedom from Noxious Gases; Uniformity and Strength.

If consumers desire it, the EXACT STRENGTH of any Powder shipped to them will be GIVEN IN FOOT POUNDS.

☞Send for Pamphlet showing methods of testing the different qualities of all Powders.

The Company manufactures:

DETONITE.

This is an explosive involving new principles and recently patented. It is the **Strongest Powder ever placed on the Market,** in this country or abroad. It is the **Safest Strong Powder ever made.** For very refractory rock this Powder is the most economical in the market.

VIGORIT. No. 1, XX.

This Powder is **Stronger than the Highest Grades of Hercules or Giant.** It is only surpassed by "Detonite." It is suitable for hard rock.

VIGORIT, No. 1.

For general work this Powder has no superior. It has the advantage over Giant, Hercules or Vulcan in safety and freedom from noxious fumes.

VIGORIT, No. 2.

Equal to any corresponding Grade in the Market.

LOW POWDER.

VIGORIT, L. P.

This is a Powder suitable for **Bank Blasting, Log Splitting** or the work generally in which Black Powder can be used. It is STRONGER THAN BLACK POWDER, having from twice to ten times the effective strength, depending on resistance. It is **Superior to Judson Powder,** in being more sensitive to the cap and more convenient in handling.

Best Qualities of FUSE and CAPS sold at Lowest Rates.

CALIFORNIA VIGORIT POWDER CO., ENGLISH & WRIGHT, Agents

No 327 Pine St., San Francisco.

BULLION SCALES.

A first-class, second-hand Bullion Scales for sale cheap. Apply to A. DOBLE, 15 Fremont St., S. F.

WIND MILL. One of the best made in this State for sale cheap on easy terms. Address, W. T., care of Dewey & Co., S. F.

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SEND FOR NEW CATALOGUE & PRICE LIST.

CLAYTON STEAM PUMP WORKS

14 & 16 WATER ST., BROOKLYN, N. Y.

GEO. R. FOARD, Agent, 18 First St., S. F.

GIANT POWDER

MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS.

Nos. ONE, TWO and THREE.

Stronger, Better and Safer than any other High Explosive

Judson Powder

IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞Triple Force Caps and all Grades of Fuse.

BANDMANN, NIELSEN & CO.,

SAN FRANCISCO, CAL.

GARDEN HOSE.

Cotton Rubber-Lined.

BEST IN THE WORLD FOR

Durability and Strength.

Every foot guaranteed. Try it. Also Cotton and Linen and Fire Hose of all sizes.

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KNIGHT WATER WHEEL.

All sizes of this Superior Wheel furnished at the shortest notice. Send for circulars to

ALMARIN B. PAUL, Agent.

Room 20, Safe Deposit Building, San Francisco, Cal

This paper is printed with Ink furnished by Chas. Eneu Johnson & Co., 509 South 10th St., Philadelphia, and 59 Gold St., N. Y. Agent for Pacific Coast—Joseph H. Dorety, 527 Commercial St., S. F.

PACIFIC POWER CO.

Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street

JOHN BERGSTROM,

ORGAN BUILDER.

29th. and Mission Sts.

Dewey & Co. { 252 Market St. } **Patent Agt's**

Iron and Machine Works.

UNION IRON WORKS,
SACRAMENTO, CAL.
ROOT, NIELSON & CO.,
MANUFACTURERS OF
STEAM ENGINES, BOILERS AND ALL
Kinds of Machinery for Mining Purposes.
Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.
Front Street, Between N and O Streets,
SACRAMENTO, CAL.

Golden State & Miners Iron Works,
Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.
STEVENSON'S PATENT
Mold-Board AMALGAMATORS,
Golden State Pressure Blowers.
First St., between Howard & Folsom, S. F.

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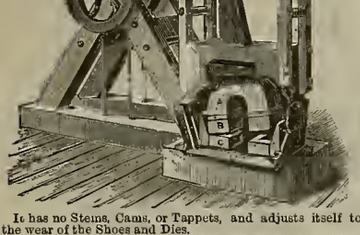

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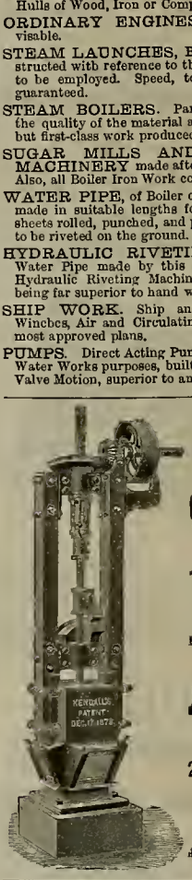

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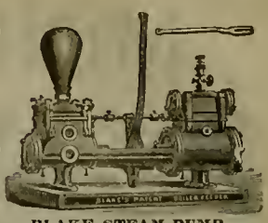

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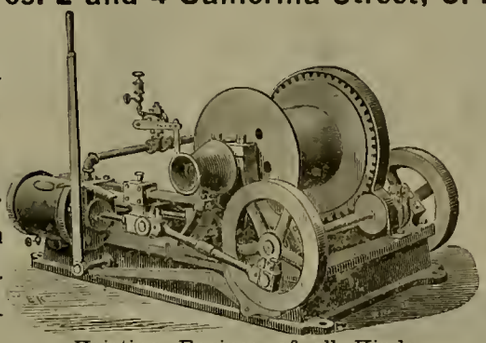

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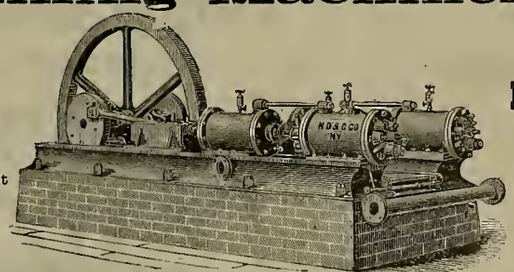

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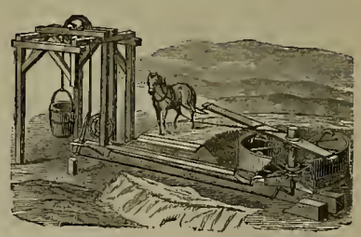

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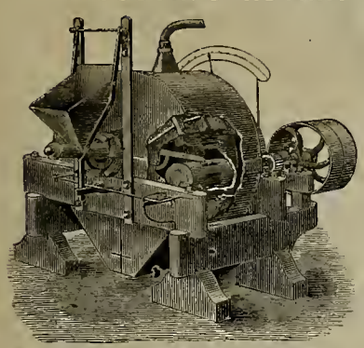

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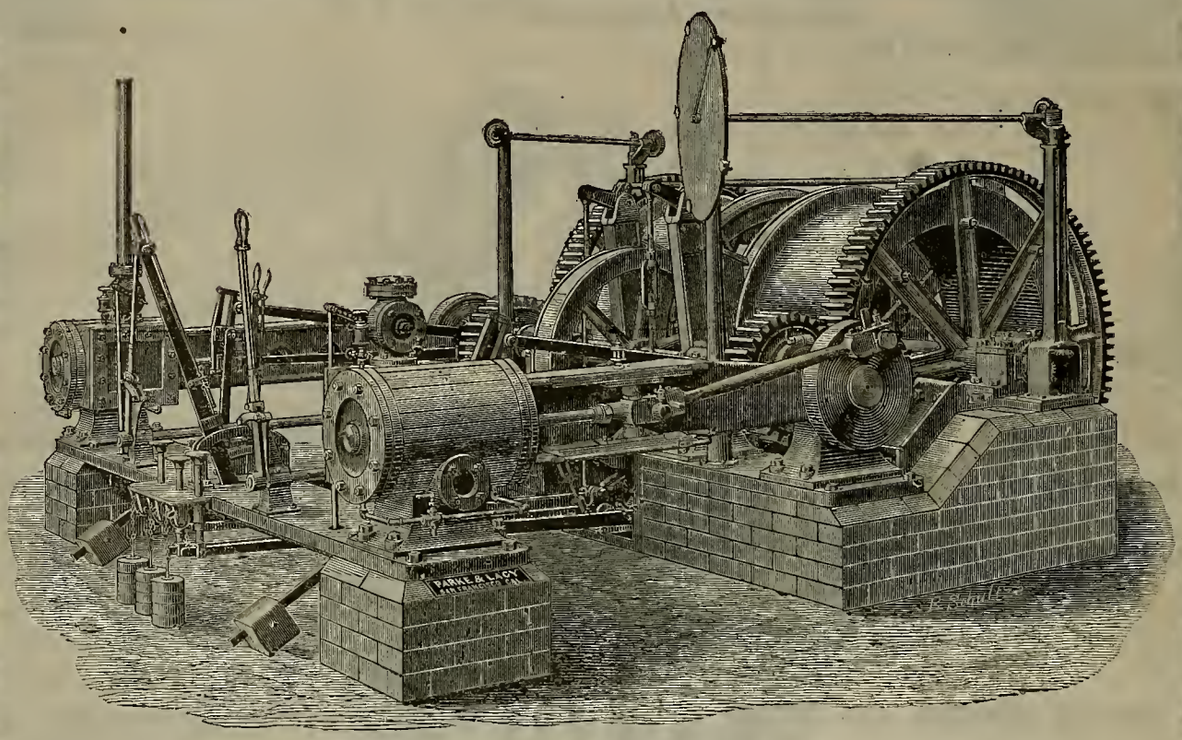

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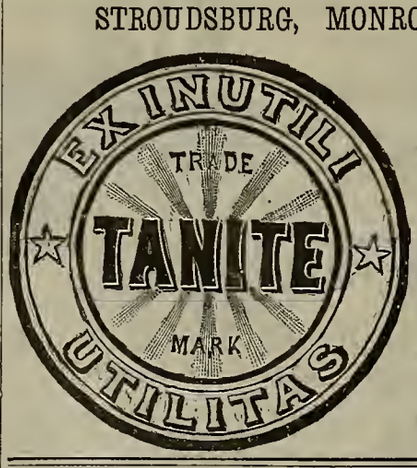

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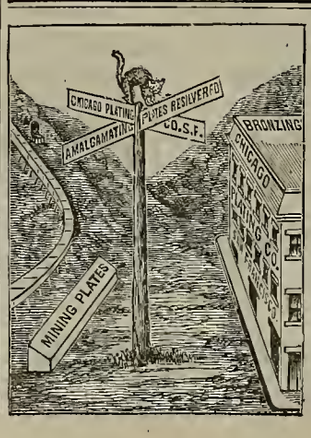

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SAN FRANCISCO, SATURDAY, MARCH 25, 1882.

VOLUME XLIV Number 12.

An Electric Light Tower

The accompanying cut represents the electric light tower, 200 ft. higb, erected at the intersection of Santa Clara and Market streets, San Jose, Santa Clara county, in this State. It commences atthe four cornere of the streets with four-inob gas pipe,which eize is used for a distance of 100 ft., then 50 ft. of three-inch, followed by 50 ft. of two-inob, the diagonal and oircular braces being of amaller eized pipe. It has a width of 75 ft. at the base and 4 ft. at the top, and is crowned by a shield wbich acte not only as a protection for tbe lamps, but also serves as a diffuser of light.

There are eix lamps of 4000-candle power each,furnisbed by the California Electric Light Co.,and driven by a No 6 Brush dynamo-electric msobine with an expenditure of nine horse-power. The effect prodnced is very much like brigbt moonligbt, the lights heing so high that none of the direct raye reach the eye. For a distance of half a mile from the tower in all directions the light is brighter than would be prodnced by an ordinary gas lamp every 75 ft., while on the two atreets over which the lights are placed there is sufficient light for ordinary purposes for a distance of two miles.

About a year ago the subject of lighting the streets of cities by meane of powerfnl electric ligbts placed at high altitudes was firet agitated in the East; and a few monthe thereafter a practical test of the matter was made at several points—the most notable one being that of the tower constructed at Akron, Ohio. This was erected from the street, of boiler iron, 207 ft. high, in the form of a mast, 36 inches at the base and 8 incbee at the top. It is held perpendicular hy iron cables in the form of guys, and the lamps are raised and lowered by machinery. In other places experiments were made by placing the ligbt on the spires of public buildings and other high elevations; but to Mr. J. J. Owen, editor and proprietor of the San Jose *Mercury*, belongs the credit of conceiving this the most beautiful, effective and suitable erection for the illumination of a city by the electric light, and the success of the experiment has exceeded the most sanguine expectations of the projector. Some time since the City Council ordered all the gas lampe extinguished, in order that the merits of tbe tower light might he tested. The result was, that one-third of all the gas lamps in the whole city will remain extinguished, the tower light heing adopted in their stead, and it is now running permanently. It was never expected that one tower would light the whole city. At first five or six were thought necessary, bnt it is now decided that four will be all that will be needed, and that number will give a much greater light than could possibly he obtained from other methods of illumination, and the tower system will have the advantage of castiog the light in the snburbs, where no gas lamps were erected, but where the property was taxed for their maintenance.

A company just organized, composed of the leading business men of San Jose, will proceed to erect otber towers to light the whole city, as well as to furnish lights for stores and other large buildings, and San Jose may justly feel proud of heing the first city on the Pacific coast to be lighted by electricity. Regarding its use at Akron, Ohio, we copy below a letter from the President of Akron City Council, J. Park Alexander:

DEAR SIR:—After a six months' trial of the "tower system" for city lighting, I am more than ever impressed with its superior merits and adaptability as a means to light all parts of a city. Our two stations (towers) displaced 325 of our 800 lamps, and have cost us upon an average for all-night lighting less than 60 cents per post per month. The same labor aod steam capacity would run four more stations (towers), and thus reduce the aggregate cost to hut a trifle more for the displacement of 600 or 700 more lampe. A very important feature of the tower system is the fact that it lights up the whole area—alleys, back streets, vacant lots, etc., that with any other system are not lighted, and mnst he the hiding places for thoee of evil intent. In this feature alone, as a governmental aid, it is worthy of mnch commendation.

I am confident that I express the candid judgment of our hest citizens, when I state that, day by day, the opinion hae gained accessions as to thie syetem bere, wbere it bas heen in constant nse since its adoption. The higher the better; not less than 200 ft., and better 500. With either hight, streete within 1,000 ft. of each station receive ahout eqnal benefit, and wben the stations are favorahly situated both sides are equally light from one or the other stations. Foliage is a source of shadows in the tower aystem; but with stations witbin 2,000 or 3,000 ft. of eacb other, the objection is of little weigbt, and is more than compensated by the enjoyable light dnring six or seven montbs of the year when there is no foliage, and that, too, in onr inclement season, when the light is the most acceptable. As a matter of economy, it is the cbeapest of all street lights. It is a bleesing to all alike, rich and poor, and must, when fairly tested, supplant all otber systems now in uee.

THE ELECTRIC LIGHT TOWER, AT SAN JOSE, CAL.

Academy of Sciences.

The regular semi-monthly meeting of the California Academy of Sciences was held on Monday evening last; Vice-Preeident Behr in the cbair.

The following were elected life members: William T. Coleman, Henry T. Scott; reeident member, Arthur A. Smith.

The following were proposed for life membership: Jacob Z. Davis, James H. Goodman, Hermann Schussler, Winfield S. Keyes, John W. Ackerson; for resident membership, Prof. J. J. Rivers, Daniel E. Hayes.

Donatione to the library included a large number of valnable publications and exchanges.

Donations to the museum were received from Dr. Arthur B. Stont—a Gila moneter, or species of large lizard; two horned toads from Arizona, (prepared and mounted); one basket star-fish from the coast of California, and specimens of asbestos from the Tyrol. W. G. W. Harford presented two species of variegated lizards, from the Arizona deeert. Captain R. W. Simpeon, a shark's jaw. J. H. Mahoney, a loaf of bread, made by the Navajo Indians of black corn. Prof. Henry A. Ward, a photograph of the *Elephas Primigenius*, in the Royal Mnseum at Stuttgart. Frank Monk, of Monterey, Cal., presented, through B. B. Redding, a mass of fish eggs on eea-weed. Tbey are from fish of the perch family. A large blackboard drawing was made by Dr. Albert Kellogg, and Mr. Harford called attention to the peculiar glutinous material by which the eggs are attached to the sea-weed, showing it to he a tenacions, transparent and viscid snbstance. The sea-weed wae a species of black *algæ*.

A. W. Jackson, Jr., instructor in Mineralogy at the State University, read a paper on "The General Principles of the Nomenclature of the Massive Crystalline Rocks."

A short paper on the increase of temperature with depth, by Chas. Forman, of Virginia, Nev., was read. This we give in another column.

Dr. H. W. Harkness presented a fine specimen of a new fuogus, allied to the puff-balls, found by Mrs. Dr. Curran near Fort Point, which is the first of this genus ever fonnd on tbis coast, and which he named *Polyposium Curranii*, in honor of the discoverer.

AID FOR BOYS AND GIRLS.—The Boys' and Girls' Aid Society is one of the associations in our midst which is deserving of hearty support, as of a practical character, doing good in a branch too apt to be overlooked. The institution became embarrassed with a debt which a thoughtful and charitable lady of this city, on being informed of the amount. paid off. At a meeting of the society the following resolution was adopted: *Resolved*, That the Secretary is hereby instructed to convey to Mrs. Charles Crocker the thanks of the Trustees of the Boys' and Girls' Aid Society for the liberal gift of $1,352.55, contribnted by her to friends of the society. Coming at the time when it did it has proved especially encouraging. By means of it all debts of the society have heen paid, and the Trustees have been enabled to enter upon the new quarter with confidence that their efforts in behalf of neglected children will meet with support from the public in future.

NINE and a half pounds of rock from the Ford & Mullen mine at Graee Valley eold this week for $589.25.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Montana Mines.

The Mines of Silver Creek Dietiict.

Editors Press:—Montana, as a mining Territory, has had some prominence since 1862. In the early days the gold placers made the world stare, and evsn now, and for many years to come, the placer ground yet unworked will produce millions of dollars worth of dust.

Lode mining is as yet in its infancy in the Territory, there not heing over half a scors of prominsnt quartz camps in the bounds of the 92,000,000 acres of land composing the Territory. However, during ths past year several

New Dietricts Have Been Diecovered

And outside capital has heen sending its experts to examins the merits of our gold, silver and copper mines.

It was not my intention in this letter to speak generally of Montana, but more locally. For many months the fame of the great Drum Lummon—on whoss merits this camp was started—has gone abroad. California capitalists have been hsre and examined the property; also, Eastsrn and foreign, but as yet the great property has not changed hands. Yet it is sincerely hoped that it will in the near future be owned by Californians.

The Drum Lummon is said to bs the

Widest Vein for its Richness

Ever discovered in the world. It shows a width of 80 ft. at 160 ft. depth, the deepest workings. It is said that the entire ledge matter will pay for extraction and milling, and a handsome profit hesides, whils some streaks in the mill, some of ssveral feet in width, go up into the hundreds of dollars psr ton in silver and gold.

Mr. Thos. Cruse, the sole owner, owns 3,000 ft. of this vein. The eastern 1,500 ft. is known as the North Star, but is not much developed. Both the claims are patented.

Mr. Cruse's reduction facilities consist of an antiquated fivs-stamp mill, two pans and a sstler, the ores carrying considerahle carbonate of copper. The process is something like ths Aaron.

Fabulous Stories

Have been told of the yield of this mill during the two years Mr. C. has heen running it, and no one knows to a certainty what it has produced, Mr. Cruss keeping that information strictly to himsslf. That it has paid handsomely no one douhts. Mr. C. began crushing ore ahout two years ago. He had just borrowed $15,000; in sight months the last installment of ths $15,000 was paid, and a handsome surplus in the bank. Since that time considerahls dead work has been done, 10 stamps and a larger engine and hoiler paid for; besides, a considerahle quantity of wood, chemicals and supplies are yet on hand.

This mine could easily and cheaply hs developed by a crosscut tunnel run in from Silver creek. An 800-ft. tunnel would cut the mine ahout 500 ft. in depth, and all the ors could he dnmped in front of the stamps from the mine car, thereby saving the cost of rehandling. In fact, if worked properly the mine is most admirably situated for economical working.

The Section of Country

Within thres miles of the Drum Lummon is slowly hecoming noted for its mineral wealth.

The Gloster, a gold mine, is well developed, has 50 stamps at work, and 30 more, making 80 in all. Will be dropping by April 15th.

The Belmont mine has hesn a steady producer of gold bullion for several years. Has 30 stamps at work. Mr. L. McL. Baldwin, a California gentleman, has heen in charge as superintendent for a fsw months, as the mine was badly managed heretofore. Mr. B. has just got it in shaps for thorough work. The 15th of this month more miners will he put on, and good dividends are expected to he paid, as the mine has vast reserves of rich quartz.

The Bluebird has a 10-stamp mill, and has produced a fortune for each of its owners, Cotter and Hinkey, and has enough in sight to start thsir children in businss.

The Bald Butte mines are owned hy three wealthy gentlemen of Helena. One of the Sharpneck one-stamp mills, made at Blair, Nebraska, has heen at work for several months on this property, and has done excellent work, crushing about six tons of quartz per 24 hours.

The Whippoorwill gold mine has a complete 10-stamp mill, but has not been running this winter, although there is plsnty of quartz in the vicinity to keep many more stamps in opsration.

Ths Penobscot has 40 idle stamps for sale, this mine having ceased to work over a year ago. There are several stories to acconnt for this, and the most likely one is that a ring is trying to get control of the mine, when a new plant will he put up and the concern run on a monsy-making basis, and not so extravagantly as before.

Outside of those mentioned, tbs Silver Creek district has any number of mines in all stages of development, which only require capital to make them famous. This district is in Lewis and Clarks counties, 20 miles northwsst of Helena. The main range of the Rocky monntains lies on tbe west of the district.

Should onr hopes he verified, and Californians purchass ths great Drum Lummon, no douht many California companies would be operating in this section bsfore many months.

Montana has enough Eastern companies. We now need and want ths experienced Western capitalist. R.

Marysvills, Montana, March 7, 1882.

Those "Obstinate" Ores.

Editors Press:—Every little while we see going the rounds of the press articles on the impossihility of extracting the precious metals from the class of ore which they style obstinate.

Now, while I admit there is difficulty in some instances, nnder certain conditions of ore and modes of handling, I deny the main proposition. Gold and silver is in no combination that the skill of this ags cannot release it from its matrix, and I will add further, easily. I defy any man to show ms gold or silver ore from which ths metals cannot he taken, and more espscially gold.

Silver is surrounded by ten-fold more difficulties when all its many possihle combinations are taken into consideration, and yet ths extraction of silver, hy practical modes, is no uncertain question. With hoth metals it is simply a mattsr of expense, profit and loss.

To properly extract the precious metals you must conform to natural demands for overcoming natural difficulties, and to do this requires, often, patient investigation, practical experiencs and mors or less scientific knowledge.

Too large a number of mining investors, I will not say experienced miners, think it only necessary to nut a set of stamps running (if working gold ore), with the addition of pans, if silver ore, and all is done necessary for success. Then if the ore does not pan out nearly up to assay it is "obstinate" or rshellious ors.

Ths trouhle often is not so much in tho ore, as in the error of ths idea, that it must yield to stamps and simple manipulation, and if it does not its obstinacy cannot hs overcome.

I have written more or less on this subject of extraction of the precious metals, and know it is all waste thought, still one would think that the multitude of failures would set sensihle men to studying a little on the various modes of treatment, of ths one hest suited to their especial ores, and believe a littls in the progress of mining as well as in other branchss of industry, before they rest all on simply stamping tbe metal out and, in the end, find stamping has crushed the ore and crushed their enterpriss at the sams time.

What a field of mining knowledge we have before us! I have heen investigating the past; have waded through the mining lore from Abraham's time to the present, and you must appreciate ths prssent knowledge when you seek to find what they knew in past ages. The advance in mining skill in the past 30 years has exceeded that of the past 3,000 years. We then must say there is hut one excuse for half the failures—a lack of study and experience. Men who invest in mining venturss must begin to properly appreciate, and pay for scientific knowledge and practical experience. They should ever hear in mind that they are working for the *precious* metals. Almarin B. Paul.

Robinson Camp, Colorado.

Editors Press:—Robinson Con. Silver Mining Co. is situated on Sheep mountain, Summit county. This famous Robinson mine, from ths first shipment to the present dats, has had her trials and troubles. A few months ago this mine hecame worthless as a dividend-paying mine. Mining experts all the way from New York were numherless, and prononnced it useless. Tbs mine was put under the able management of J. B. Stevens, wbo, heing accustomed to underground mining on the Pacific coast for many years, thoroughly nnderstands mine managsment. To-day Rohinson comes the front with large bodies of high-grade mineral in sight. We notice to-day several assays from the offics, which run 350 ozs. per ton. At present the mine is shipping over the Denver & Rio Grande railroad 15 cars daily to Leadville.

Owing to late developmsnts, with satisfactory results, no doubt Robinson may again stand at the head of the prominent Colorado mines. Ws learn from the Superintendent, Capt. S. Evy, that they will next month ship 20 cars daily over ths Denver & Rio Grande to Lsadville, which will show the good condition of the Robinson mine to the puhlic at largs.

O. M.

Robinson Camp, Colorado, Mar. 10, 1882.

The Alice, Moulton, Lexington and Silver Bow mills and the Bell, Montana and Colorado and Parrot smelters, Montana, are all in smooth and successful operation and are turning ont bullion and matte at a lively rate.

The Ontario mine of Utah has produced hullion valued at $9,356,290.22, and has declared a dividend (No. 76) of 50 cents per share, of $75,000, payahls Feh. 15th; total to date, $4,100,000.

There are nine mills in Galpin county, Colorado. These mills are rnn to their fnll capacity, and carry 447 stamps.

Value of Bars.

Largs hullion scales, and troy weights, ars not always at hand; yet it is oftsn desirable to know the valus of a har hefors sending it from ths works, and as good counter scales, with avoirdupois weights, are generally accessible, the following facts may hs fonnd useful.

The assay value of ons avoirdupois pound of purs silver is $18.85; that of ons avoirdupois ounces is $1.17. The pound of pure gold is worth $301.44, and the ounce $18.84. Hencs it is easy to calculate the value of a har of which the fineness is known, and which has heen weighed on common counter scales to the nearest quarter ounce. For example, a silver har is .969 fine, and weighs 82 lbs. 3¼ ounces.

Then: $18.85 × .969 = $18.26 × 82 = $1,497.32
and 1.17 × .969 = 1.13 × 3¼ = 3.67

Making ths value of the har..... $1,500.99

Each 1-1000th of silver in a har is worth 1.885 cents, and sach 1-1000th of gold 30.14 csnts per avoirdupois pound; thsrefore, if in the above example the bar contained also a littls gold, say .003, and perfect accuracy is not required, it would be sufficient to add to the value 3 times 30.14 cents for each pound weight, or in all $74.14. Again, a gold har is .969 fins and weighs 7 lbs. 13½ oz., or 125½ oz.; then 18.84 × .969 = 18.26 × 125½ = $2,291.63. Or, the value of a gold bar may be calculated as though it were silver, and the result multiplisd by 16.

The commercial or market value is different from the assay value. The discount on silver varies from 10% to 15% of the assay valus, to which is added ¼ of 1% for mintage, or assayer's fee. Gold bars fres from hass metal are subject to a discount or a premium, equal to 1-10 of 1% for every 10 "points," or thousandths, ahove or helow the quoted par finsness; discount if ahove, premium if hslow. The apparent anomaly is due to ths fact that, if there is no hase metal in the har, all that is not gold is silver, whencs, at par finensss, thers is just enough of silver in ths bar to pay parting charges, etc., whils in a finer bar those charges must he met by a discount on the value of the gold. Conversely, a har which is below par fineness commands a premium for the sxtra silver it contains. On account of this arrangement, bars which are more than half gold are stamped with the gold value only, unless they contain much hase metal, when both gold and silver valus is stamped on them. These facts ws take from Aaron's "Leaching of Gold and Silver Ores," for sals by Dewey & Co.

Mixed hars, in which ths gold forms a large part of the valus, but less than half ths weight, are called "dore" hars, and are stamped with the value of hoth the gold and the silver.

Concentrate on One.

There are hundreds of minsrs, all over Arizona, who own from five to a dozen mining locations. To comply with the law aud keep up the yearly assessmsnt work on so many claims, is no easy job for a man who has no other capital than the labor of his hands. If a poor miner should own a dozen claims and desires to keep his title good to all, hs will have to spend $1,200 in work and improvements every year. A miner has got to rustle pretty lively to supply himsslf with grub and clothing and perform the yearly work on so many locations. The fact is, he can't do it, and do justice to himself or fulfill the requirements of the law. The result is that hs keeps himself as poor as the traditional church mouse, and in his efforts to hold on to all his claims, develops none. The little scratching he does yearly on each is of no henefit to the propeity, and in some instances, it might hetter he left undone. We say to our mining friends, this is a policy which will never yield them any substantial results. If you own ten or a dozen claims, select ons or two of ths most promising, and concentrats all your energies in their development. Let the others go. Remember that one good claim is better than a hundred wildcats. If you frittsr away your resources on 10 or 20 prospects, they will always remain prospects, whereas, if you put the work you expsnd on all of them on one, you can hope for some rsward for your time and labor. We know how miners feel ahout parting with a prospect they have held on to, perhaps, for years, hut it is hetter to leave it go than waste many years more in waiting for the capitalist who will never come to purchass it. Devots all your resources to the thorough opening of ons location, then you will discover before the year is out that $1,000 in work and improvements expended on one claim will bs 1,000 times more beneficial to you, financially, than if you had thrown it away on ten. Your purss will he heavier, your heart lighter and you may be in a condition to visit the old folks at home when the A. & P. draws nearer. Try it.—*Arizona Democrat.*

The indications are that there will he a good dsal of prospecting the coming season to the eastward along the route of the Carson and Colorado railroad for deposits of niter, horax and the like.

Dayton prospectors are still moving out to the eastward. Garfield district appears to he their favorits range. Some sxcsllent finds have already heen made.

The bullion product of ths Idaho mine, Grass Valley, for the month of February (four weeks) was $43,000. The usual dividend of $7.50 psr shars, amonnting to $23,250 will be declared.

Open up Your Prospects.

My friend, if you own a mins and want to dispose of it for anything liks a respectable figure, open it up. You may bs as poor as an Arizona editor, but if you havs health and strength, you have the capital which naturs gavs you, and which you can always apply. Don't forget the pertinent fact, that because you have discovered a ledge and snnk a "pot hols" on it, that it is a mins. By no manner of means. Unless it shows extraordinary richness, it is a proposition of very indsfinite value; and even a merchant, looking at the matter from a business point of view, might object to advance a sack of flour and take it as collateral. But if you should use a little muscle and go down 80 or 100 ft., you might strike something that would enahle you to patronize two-hit saloons, go to "Yurrup," and move in ths vsry highest circles for the rest of your days.

Remember that you've got to eat grub while in camp, and a little exercisa polishing ths head of a drill will give you a good appstite. But ahove all things, remember that you can hardly give a prospect away in the Eastern market. If you think you havs got a mine, open it up, and our word for it, if you can show a fair property, with reasonahle development, you will not have to wait long for a huyer.

Therefore, we advise our mining friends to givs up the insane idea which some of them possess of selling their prospects for thousands of dollars. You can't do it; and you might hang on to them until you see the csntury out, before you will find aman who will give you a small fortuns for a coyots hole. We havs had soms experiencs in that line ourselves, and reliable data from ths miuing centers of ths East snahle us to assert as sample facts what we havs written. So, boys, pitch in; develop your mine and muscle at the same time, and in the good days coming, when the "solid man" from the East comes to look at your claim, you can show him a mine and not a gopher hole.—*Arizona Democrat.*

The Arizona *Democrat* says: Inquiries ars coming from everyhody who has a friend and acquaintance in this neighhorhood, and a few words in print will save writiog many letters. We cannot advise miners to come hsre who would arrive here without funds. Almost everything in the mining line is in embroyo here. Thers are no large operations in progress. Only two mills are running in the county. The Tip Top and ths Tuscumhia and other companies are overrun with applications for labor. It is not even a good tims to come hers for prospecting, for all ths high hills and mountain ranges are covered with snow from 2 to 4 ft. deep, and it is csrtain to snow more within the next thirty days, in fact a storm seems to hs commencing as we pen thess lines. Six weeks from to-day, say the 15th or 20th of April, is soon enough for any one to get hsre who wishes to huy mining property, to prospect or to look for work. We helisvs that those who wish to invest in mining can find no better chances than ars presented in Yavapai county, up to a csrtain limit as regards devslopmsnts.

New Mining Region.—The Tucson *Star's* correspondent, who accompanied ths engineers who are running the line of ths Tucson and Gulf of California railroad, writss that the party has run across a wonderful minsral country near and in Myer's district, about 70 miles west of Tucson. The region is unexplored, and is revealing daily vast ledges of mineral of silver and copper. The party have located a large number of claims along the line of their route. Prof. Van Buren, who accompanies ths expedition as mineralogist, says it is the most extraordinary mineral section he has ever seen. The quantity of mineral on the surface is described as wonderful. Ths party will return and make their report about the 15th of next month. Col. Chamhers Scott, assistant of engineers of the Central Pacific railroad, is in charge of the surveying party.

Mining Exhibition at Madrid.—An exhibition of ores, metallurgical processes, etc., is announced to open at Madrid on the 15th of May next. Besides raw materials, such as iron and zinc ore, manufactured products, from a girder to a finished machine, will he admitted. All the ore must be of nativs production, but steam engines from other countriss may be exhibited. The whole process of coal mining will bc shown in operation; and a model of a colliery, with the seams, etc., is to bs constructed. The Rio Tinto mining company will exhihit largely, and the buildings and grounds will be illuminated by electricity. Premiums will he granted to deserving exhihits, and lectures are to hs giveu on mining and metallurgy.

Owing to the fact that great quantities of ice were housed last winter, the Comstock will not make very heavy demands upon the ice companies of the Sierras. Ths Sutro Tunnel company has housed a two years' supply, and the Virginia City and Gold Hill Water company have stored away sufficient to last the leading mines of the Comstock a long tims.

Says the Truckee *Republican:* Judge Keiser has sold the property known as ths old smelting works, a short distance bslow town, to parties who propose purchasing machinery and going into the business of making boxes extensively. The price paid was $750. The same property sold at one time for $28,200.

MECHANICAL PROGRESS.

Malleable Cast Iron.

This term is applied to the product of a special metallurgical operation, which consists in annealing castings in various substances—oxide of iron and lime, for instance. The metal which, before treatment, was hard, brittle, and easily fusible, becomes soft and malleable, capable of being worked by tools, and very difficult to melt. Reaumer was the first to publish an account of this method, although it was probably known before to a few skillful workmen. All classes of cast iron are not equally suitable for this process. Gray and manganesiferous pigs do not give good results; but white and mottled pigs, obtained from very pure ore, are chiefly in request. The process is more easily applied to small objects; and the time of annealing varies, according to size, from two to six days, the temperature of the ovens being 1832° Fahr., corresponding to bright cherry red. Peroxide of iron is about the only substance for cementation now in use. Layers of red hematite, granulated, are placed, between the objects to be annealed, in large pots, luted hermetically and placed on the bottom of the furnace. Care should be taken to allow them to cool completely before leaving the furnace. M. Forquignon has made some researches on the subject, from which he concludes that the softening of the cast iron does not necessarily result from an oxidation of its carbon, but that this oxidation, when it takes place, plays quite a subordinate part. By the action alone of a temperature sufficiently high, but inferior to the point of fusion, the white pig, which is formed by absorption of heat, is destroyed—carbonized, if the expression be permitted. A veritable amorphous graphite, belonging to a special variety, is abundantly deposited throughout the whole mass of the bars, sometimes in the form of small visible agglomerations, and sometimes in a state of dissemination and intimate mixture. Instead of a combination, there is now only a mixture, more or less intimate, more or less homogeneous, of free carbon with free iron, or with a less rich carburet of iron. The pig-iron, deprived of a portion of its combined carbon, is softened, and its resisting properties are modified, chiefly by the change which its structure has undergone.

The operation ends here, if the annealing takes place in an inert substance like coal; if, however, the castings are in contact with a substance capable of burning or absorbing the carbon, a secondary reaction takes place. The free carbon being eliminated from the uppermost layer, the equilibrium determined by the calorific influence is gradually modified; a portion of graphite from the lower layer enters into combination, passes towards the surface, and then disappears, its place being taken by another. The same succession of phenomena is reproduced, until the mean composition of the bar corresponds with the minimum of carburation of the iron in a given case. On the other hand, in an inert medium, the relative quantity of carbon which remains combined is evidently limited by the maximum of carburation, or, in other words, the maximum of solubility of the carbon at the temperature at which the operation takes place.

Such a process recalls, in its general features, that of the cementation of iron; but it is, in principle, more complicated, since it results from the superaccession of two distinct chemical actions. It is easy to understand how this result may be attained by annealings carried to excess in a suitable cement. M. Forquignon does not think that the heat due to the combustion of the free carbon contributes materially to the production of graphite in the oxidizing cements; and annealing with coal would appear to prove that the heat disengaged by the decomposition of the carburet of iron sufficea to explain all. The same disengagement of heat is probably the source from which the carbon draws the energy it requires for combining with the hydrogen and nitrogen.

A proportion of manganese, even less than five-thousandth parts, is sufficient to prevent the softening, which ceases absolutely to be appreciable as soon as the quantity of this metal reaches 2%. As the heat due to the formation of silicate of manganese is very great, it follows that the silicon may, to a certain extent, saturate the manganese and set free the graphite. It should be observed that the castings lose silicon in alkaline cement, in iron filings, and a mixture of sea salt and colcothar, while the lime exerts an oxidizing action. Besides, whatever be the cement employed, the order of the phenomena remains the same; it is only their intensity that varies. Malleable cast iron occupies an intermediate place between steel and gray pig. It differs from the latter by the special nature of its amorphous graphite, as well as by its greater tenacity; and from the former by its slight elongation and its high percentage of graphite. —*London Iron.*

THE OLEANDER POISONOUS.—All parts of the oleander are deadly. A very small quantity of the leaves has been known to kill a horse. The flowers have produced death in those persons who carelessly picked and ate them. The branches, divested of their bark and used as skewers, have poisoned the meat roasted on them, and killed 7 out of 12 persons who partook of it.

A Street Car Improvement.

A street car "man-catcher" has been invented in France, intended to serve for persons falling in front of cars, somewhat as our cow-catchers do for cattle on the track, only the cow-catcher is intended to protect the train, and not the animal, which is usually killed by it as effectually as if it had been run over, while the "man-catcher" is intended to protect the man, and not the car, and therefore contrived to remove the body from before the wheels without seriously injuring it. This contrivance is thus described by the *Railroad Gazette:*

It consists of a plate-iron apron in front of the wheels, with a rigid frame attached, not to the car body, but to the journal boxes, so as to be always the same distance from the rails. This frame carries a plate-iron plow or shoe, the front of which projects in front of each wheel and reaches to within 1½ inches of the rails, and turns aside and away from the car anything that may happen to lie on the rails. The front guard plates are hung on springs, so as to lessen the shock when they strike a body. The apparatus weighs about 100 lbs. per car, and costs (in France) about $9. Experiments made with a manikin presented in all sorts of positions are said to have resulted in throwing it to one side in every case while the car was going at a smart trot. Further than that it is reported that the apparatus was placed on a line in August, 1878, and that since then there have been 14 cases where persons have fallen in front of the cars, and in every instance they have been thrust out of the way of the wheels by the "man-catcher," without serious injury.

The inventor, M. Massilon, has been awarded a gold medal for the device. There is much need of such a device in this city, as the frequent accidents upon our streets fully attest. A single case has cost nearly or quite enough, in the way of damages awarded, to provide the device for an entire road.

MEASURING POWER.—At a recent meeting of the Polytechnic Association of New York city, Mr. John W. Sutton remarked that there were two general systems. One extinguished the power it measured by friction induced for the purpose, and could only be used a short time as a test. The other measured without much retarding, and could in theory be used all the time. The horse-power of engineers' parlance is a little more than an average horse can do steadily ten hours a day. It is thirty-three thousand foot-pounds per minute. It is 550 pounds lifted one foot high each second. On the transmission system, Mr. Sutton's favorite dynamometer was a pulley connected to the shaft by springs with delicate devices for observing while running exactly how far the springs were deflected to know the strain in pounds, which, being multiplied by the velocity in feet per minute, gives the number of foot-pounds per minute. For a crude measurement a belt just able to do the required work without slipping could, with cheap apparatus, be made a test of power. Find by repeated trials just how much strain on a lever of a given length will slip the belt when the machinery is stopped, and we have the strain under which the belt is acting while in use, which, multiplied into the speed, gives the power.

BLUE MILK.—The blue appearance which milk sometimes presents after standing a few days is due to an organism which is allied to bacteria, and can be transplanted into other samples of milk and various solutions. It thrives according to the proportion of acid present and the condition of the casein; it appears after a certain degree of acidification has taken place, and prevents the further formation of acid. The casein must also be unchanged; it is then held in solution during the bluing process. The blueing occurs only in presence of oxygen, and is attended with evolution of carbonic anhydride.—*F. Neelson, in Bied. Centr.*

PECULIAR PHENOMENA.—A writer mentions a peculiarity of newly tempered circular saws, which, when laid down to cool, commence to hum, and if not quickly replaced in the furnace will crack. The humming begins in a low, musical key, and rises in tone until it ends in a snap. The saw does not always crack through from the eye to the perimeter, and it never does so if it is got into the furnace while humming in a low tone. If the crack proceeds but a part of the way, it is from the bottom of a tooth or space and toward the eye. Saw makers do not seem to be able to explain this singular and costly phenomenon.

TO OIL A MILL SPINDLE.—Somebody says: The best way to oil a mill spindle is to guide the oil through a small gas pipe half an inch in diameter, from the outside of the curb down below the burst frame to the bottom of the stone, and thence with an elbow to the bush, upward to a level with the top of the bush. This will thoroughly oil the spindle, and is not a very expensive arrangement.

SHARPENING MILL PICKS.—Emery wheels have been quite extensively used for sharpening millpicks. The best size of wheel for this purpose is said to be eight inches in diameter by one and one-half inches thick. A machine for the purpose of sharpening mill picks, with wheel complete, is in the market and can be purchased for about $30.

SCIENTIFIC PROGRESS.

EXPLOSION OF WATER.—An experiment may easily be made by any person having the means at hand that will illustrate the fact that water practically explodes when relieved with sufficient suddenness of high pressure, while at a temperature due to that pressure, as it is in a steam boiler. Place a piece of dry wood or other not very strong dry porous body inside of a short piece of iron pipe containing water. The pipe, say a short piece of steam pipe, having been fitted for this experiment by attaching to one end a gate valve, with an open way as large, or nearly as large, as the opening in the pipe, and to the other end of the pipe attaching a steam pressure gauge and a safety valve, the whole will be a miniature steam boiler, with water and a pit of wood in it. After fixing the small boiler firmly upon a suitably firm foundation, where steam can be raised, apply heat and raise steam to any desired safe pressure, and maintain it till the porous body in the water becomes thoroughly saturated with the boiler water—a few minutes will suffice; then let the gate valve be opened with a jerk. The instantaneous escape of the steam, followed so closely by the exploded water as to be sensibly simultaneous, may be expected, and the porous bit of wood (which should be of considerable size), if it can be found at all, will be reduced to fine splinters by the expansion, practical explosion, of the water with which its pores have been filled.

A practical application of this experiment is the reduction of wood and other suitable material to fiber preparatory to making your paper pulp. This has been successfully done, but it was found too slow when conducted on a safe scale, and dangerous when done on a commercially economical scale.—*Scientific American.*

KOPLOGRAPHY is the designation given to a new art for which letters patent have recently been taken out by S. K. Devereux, of New Brunswick, N. J. Specimens of this work were exhibited at a late meeting of the polytechnic branch of the American Institute, of New York, by the inventor, who described the process as follows: Cherry, or other tolerably hard wood, is treated on or near the surface with any suitable "filler" and smoothly finished. It is stained preferably a very dark color. Then any designs—preferably hand-made and highly artistic—being drawn or stenciled thereon, the portion of the surface representing these designs is sunk by a rough-pointed instrument, worked by hand with a hammer or by any suitable machinery. The figured portion, with a portion of the adjacent plane surface, is then treated successfully with shellac and gold size, and all which lies on the plane surface is wiped off. When the size is just sufficiently dried, gold-leaf is applied. The gold-leaf is retained on the sized surface only, and is protected by its sunk condition from any wear in the wiping or other treatment of the work. The invention is being tested on some of our standard manufactures of woodwork, including Stevenson's cars and Steinway's pianos. A picture of the landing of the pilgrims is being prepared by this process, on a panel 6½x6 ft., for the steamer *Pilgrim*, being built at Chester.

AN ILLUMINATED BUOY is one of the latest contributions of science to the welfare of man. Imagine an enormous lamp riding the waves. The buoy is a compact wrought-iron vessel, which serves as a receiver of compressed gas. The duration of the flame depends upon the size of the buoy. Some in use in Europe have been made to burn 30 days and some 120 days. It is said that a buoy of sufficient size will contain gas enough to furnish the light for one year. During that time the flame is steady and constant night and day, requiring no attention whatever after once put in operation. The lantern attached to the buoy admits air enough to feed the flame, but not a particle of water can enter. The most violent gales, the greatest force of the waves, submerging even beneath them, has no effect upon this light. It burns with undimmed brightness as long as gas is in its reservoir. The light, it is said, can be thrown six or seven miles in clear weather. Salty deposits are not made on the glass of the lanterns, as has been demonstrated. The refilling of the buoy at certain intervals is performed by a tender, and requires but a few minutes' time. It is done by passing the gas from a storeholder, which contains the gas compressed to ten atmospheres, by means of a flexible tube into the buoy at a pressure of six atmospheres.

NEW APPARATUS FOR THE DETERMINATION OF MELTING POINTS.—The apparatus consists of a small platform of thin ferrotype iron or silver, having an opening for the reception of a thermometer bulb, and a small indentation or depression about 1.5 mm. deep and 2 mm. in diameter. A very small quantity of the substance is melted in the little depression, and while still liquid, a thin platinum wire, bent like an L and fused into a glass float, is immersed in the liquid and held there until the substance solidifies. A thermometer is then inserted in the opening, and the whole apparatus plunged under mercury. The mercury is gently heated and the thermometer carefully watched. As soon as the substance melts, the float rises instantly, and the temperature is noted. Stirring is unnecessary; the whole of the substance is surrounded with mercury, and the attention can be concentrated on the thermometer.

SINGULAR EXPLOSION OF OXYGEN.—M. Sehere, of St. Brienne, has been in the habit of storing his oxygen in a large gas holder of galvanized iron, holding 100 liters and sunk in water. After being about half full for several weeks, he was about to make use of it by carrying a jet of the gas to a flame, with the result of the whole violently exploding. An investigation proved that no carelessness was at the bottom of the matter, the explanation being of a most simple nature, and one that theory would have predicted. A galvanic action had been set up between the iron and the zinc, and hydrogen had been liberated, an explosive mixture of the most powerful character being thus manufactured in the middle of the laboratory. M. Sebere's arm was broken, the place was deluged with water, and considerable further damage resulted. In order to prevent a similar accident, for the future M. Sehere will always keep the interior of his gas-holder well varnished.

THE MOUNT ETNA OBSERVATORY.—The municipality of Catania, in Sicily, has just completed the erection upon Mt. Etna of an observatory at the height of 9,671 ft. above the sea level. It is believed that in the Etna observatory, spectroscopic results will be attained which are impossible at all the previously existing astronomical stations throughout Europe. The site of the observatory has been so selected that, in case of an eruption from the crater, a stream of lava would be divided above the building, and would pass it without injuring it. The structure surrounds an enormous pillar, which supports the great refractor, and the telescope is covered by a movable iron dome. In addition to the telescope, the building is furnished with a collection of meteorological and seismological instruments. From the summit, a lovely view is to be had of the half of Sicily, Malta, the Lipari islands and part of Calabria.

NOVEL REACTIONS OF MILK.—If a little tincture of guaiacum is added to fresh milk, a blue color is produced. Milk heated to 80° or upwards remains uncolored. Sour milk takes the same tint, but the reaction is prevented by the addition of mineral acids and alkalies. If a little starch paste mixed with potassium iodide is added to milk which has been mixed with old oil of turpentine, a fine blue hand appears at the surface of contact and spreads rapidly. Milk freed from albuminous matter does not give this reaction. If to fresh milk there is added first acetic acid to precipitate the caseine, then some caustic potassa, and lastly a trace of a solution of copper sulphate, the violet reaction characteristic of peptone does not appear; but if the milk is allowed to stand 15 to 20 hours before this treatment, the violet color is obtained. Mr. Arnold considers the blue color due to ozone.—*Scientific American.*

SEA WATER ON THE STREETS BAD FOR IRON PIPES.—At the late meeting of the American Institute at New York, Mr. West said salting the streets, or any parts thereof, had been forbidden in many or most cities. In London, it was averred that salting was injurious to the health; he did not know on what grounds. In one of the coast cities of Canada the streets had been sprinkled with sea water, and it was averred by the gas company that the iron pipes in the streets, even far removed from the surface, had been injured by the saturation of the earth with salt.

METEOROLOGICAL RESEARCH.—It is stated that M. Mouchez, Director of the Paris Observatory, is making arrangements for taking meteorological observations at an elevation of 2300 metres by means of a captive balloon. The balloon will be charged with ordinary coal gas. The observations will be specially directed to obtain such data as will facilitate the calculation of atmospheric refraction.

PROF. W. E. AYRTON has invented a sort of web conductor, closely resembling that made by M. Andre. The metal wires form the web of a fabric of which cotton or hemp forms the warp. To secure better insulation, the web may be steeped in melted paraffine, wax or bitumen.

SCIENTIFIC PRIZE OFFER.—A prize of $550 is offered by the Royal Italian Scientific Institution at Venice, for a "statement of the hypothesis recently advanced by physicists on the causes of the phenomena of light, heat, electricity and magnetism."

BY keeping glycerine, castor oil and other viscous liquids in regular motion for some time, Dr. Margatea says, according to *Les Mondes*, that he has obtained a series of characteristic figures.

STEEL BELTS.—A patent recently granted in Vienna and Berlin uses bands of steel, which is tempered and hardened, to transmit motion from one pulley to the other, the faces of the pulleys being turned perfectly flat and then faced with a varnish of resin, shellac and asphalt.

THE Mexican and Ophir mines were each in debt upward of $22,000 on the 1st of March, and assessments are expected.

A NUGGET of gold weighing $130 was found by a Chinaman near Angel's, Calaveras county, one day last week.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Mar. 2.		Week Ending Mar. 9.		Week Ending Mar. 16		Week Ending Mar. 23	
Alpha	1.70	1	1¼	1.10	1¼	1.10	1¼	80c
Alta	3.20	3	3.35	2.70	3.40	2 65	3.15	2.90
Andes	50c	35c	75c	45c	75c	45c	85c	70c
Ablion	2	1.85	2.90	1.80	3.45	2.6c	3.20	2.95
Argenta	....	....	....	....	5c	....	10c	....
Addenda	....	....	....	....	....	....	10c	....
Belcher	50c	35c	60c	23c	75c	55c	60c	50c
Belmont	60c	40c	50c	....	50c	....	....	....
Best & Belcher	6¼	5½	6⅝	6	6¼	6	6⅝	6
Bullion	1.20	60c	95c	65c	75c	70c	75c	55c
Bechtel	....	....	35c	30c	35c	....	35c	30c
Belle Isle	5c	....	....	....	....	....	....	....
Bodie	3.90	3	4.80	4.35	4.55	4.20	4.45	4¼
Benton	70c	60c	60c	50c	45c	35c	45c	40c
Bulwer	2.40	....	2	1.85	1⅞	....	2.10	2
Boston	....	....	....	....	....	....	50c	....
Black Hawk	100	....	....	....	10c	....	....	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	15c	10c	....	....	....	....	....	....
California	35c	20c	45c	30c	35c	30c	35c	25c
Challenge	....	....	40c	....	....	....	....	....
Chollar	1.20	95c	1.20	1.05	1.20	1.10	1.20	1.05
Confidence	1.40	90c	1	....	1.90	1	80c	60c
Con Imperial	10c	....	10c	....	10c	5c	10c	5c
Con Virginia	50c	30c	95c	75c	90c	75c	90c	75c
Crown Point	45c	35c	40c	25c	35c	20c	45c	25c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	70c	....	80c	75c	1	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	5c	....	30c	....	25c	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	1.30	85c	1⅛	....	1⅛	1.40	1⅛	1.35
E. Mt. Diablo	30c	....	30c	25c	25c	20c	25c	20c
Eureka Con	13	12½	16½	13¾	23	19	24	19½
Exchequer	60c	35c	60c	40c	50c	40c	45c	40c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	....	....	40c	....	35c	....	25c	....
Gould & Curry	3.35	2.85	3.35	3.05	3.30	3.10	3.55	3.05
Hale & Norcross	1.60	1⅛	1.55	1.05	1.30	1.05	1.20	1.05
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	20c	....	20c	....	20c	....	15c	10c
Justice	75c	70c	70c	65c	75c	55c	70c	55c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	70c	15c	....	....	....	....	25c	20c
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	5c	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	45c	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1⅛	1⅛	1⅛	....	....	....	1⅛	....
Martin White	6	5½	7⅞	....	7½	7	6½	5⅝
McClinton	....	....	....	....	....	....	....	....
Mono	1.60	45c	1.45	1.35	1½	1⅛	1⅛	1¼
Mexican	10	8⅜	9⅜	8⅜	8⅞	8⅜	8⅝	7⅛
Mt. Diablo	6⅛	6¼	6⅛	6¼	6	....	6	5½
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	25c	20c	35c	30c	1.05	40c	1½	90c
New York	....	....	....	....	....	....	....	....
Northern Belle	10½	9½	10	9⅜	9¼	9½	9	8⅜
North Noonday	25c	....	30c	....	75c	50c	1⅛	70c
Navajo	35c	....	....	....	30c	....	35c	30c
Occidental	80c	75c	....	....	75c	70c	75c	....
Ophir	5	3.80	4¼	3⅛	3.65	3⅛	3.65	3.10
Original Keystone	....	....	....	....	....	....	....	....
Overman	55c	45c	55c	40c	45c	35c	35c	30c
Oro	35c	25c	40c	30c	40c	30c	40c	30c
Paris	....	....	....	....	....	....	....	....
Potosi	1.15	90c	1.10	85c	1.05	1	1.15	95c
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1⅛	1¼	1.40	1	1.20	1	1.20	90c
Seg Belcher	1⅛	1	2.40	1.60	1⅞	1⅛	2.4	1.85
Sierra Nevada	8⅜	6	8⅜	7⅛	7⅞	7⅛	7⅞	7
Silver Hill	....	....	....	....	....	....	15c	....
Silver King	18⅛	18⅛	18⅛	16⅞	18	17⅛	17⅝	17⅛
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	90c	65c	90c	70c	80c	65c	90c	70c
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	25c	20c	....	....	15c	....	20c	....
Tioga Con	....	....	30c	25c	20c	....	25c	20c
Tiptop	1.20	....	....	....	5	....	4.60	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	11⅜	9⅝	11⅜	10⅜	11⅜	10⅝	11⅜	10
Utah	6¼	5	5¼	4¼	4¼	4.35	4.65	3.80
Ward	3¼	....	....	....	3¼	....	3¼	....
Wales	60c	55c	55c	50c	55c	....	60c	55c
Yellow Jacket	85c	65c	70c	20c	1.45	1.10	1.05	1

Sales at S. F. Stock Exchange.

Thursday A.M., Mar. 23

100 Alta 3
20 B & Belcher 6¼
615 Belcher 50c
3040 California 25c
215 Con Virginia ..... 80@75c
1020 Chollar 1.20
40 Crown Point 40c
1000 Con Imperial 5c
50 Confidence 60c
10 Gould & Curry 3.15
610 Hale & Nor ..... 1.05@1.10
150 Justice 60c
210 Julia 10c
120 Kentuck 25c
150 Lady Wash 5c
160 Mexican 7½
50 Ophir 3.10
890 Potosi ..... 1.05@1.10
700 Savage 95c
60 Sierra Nevada ..... 7⅞@7¾
30 Seg Belcher 1.85
4 Sutro 100
80 Utah 3.80
220 Union ..... 10¼@10½
220 Yellow Jacket ..... 1.05@1

AFTERNOON SESSION.

1415 Albion ..... 2.60@2.55
700 Atlas 11
1100 Belding ..... 25@20c
100 B O'Neill 75c
130 Bodie Tunnel ..... 1.45@1.40
315 Bodie 4½
50 Bulwer 2.15
600 Concordia ..... 1½@1.60
100 Eureka Tunnel 1.05
135 E Mt Diablo 21c
600 Goodshaw 35c
200 Mono 1.70
50 M White 6¼
475 Noonday 1.35
200 Navajo 35c
550 N Noonday ..... 1.30@1.40
100 Oro 40c
170 Southern Nev ..... 6½@6¾
25 Tioga Con 10c
200 Tiptop ..... 4.60@4.60
300 Wales 60c

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

New York Hill, March 18th, $6,400; Enreka Con., 10th, $9,227; Christy, 13th, $1,909; Mt. Diablo, 11th, $8,048; Waterman, 14th, $25,000; Contention Con., 16th, $13,121; Mt. Diablo, 14th, $6,272; Horn Silver, 16th, $15,000; Hananer, 16th, $2,050; Germania, 16th, $2,000; Tehama (Rocky Bar, Idaho), 14th, $4 900; from Silver City, Idaho, 14th, $8,618; Germania, 14th, $5,015; Bodie 19th, $8,196; Contention, 13th, $13,120.97; Northern Belle, 13th, $7,155.32; Northern Belle, 16th, $7.008.11; Tiptop, 16th, $10,300; Contention, 17th, $15,819.24; Eureka Con., 12th, 13th, 14th, 15th, $15,898.76; Mt. Diahlo, 20th, $8,000; Horn Silver to March 15th, $155,000; Horn Silver, 16th, $15,000; Hanauer, 16th, $2,050; Germania, 15th, $2,000; New York Hill, 17th, $6,200; Horn Silver, 18th, $25.000; Richmond Con. 19th, $23,692; Frisco, 10th, $5,595; Christy, 19th, $2,113; Bodie Tnnnel, 22d, 306 ozs. of gold bullion, valne not stated, bnt estimated at $3,000; Noonday, 13th, $6,681.82; North Noonday, 13th, $10,271.59; Stormont (Utah), 11th, $5,320.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Albion Con M Co	Nevada	10	30	Mar 6	Apr 10	May 2	D B Chisholm 327 Pine st
Alpha Con M Co	Nevada	16	50	Mar 20	Apr 26	May 19	Wm Willis 309 Montgomery st
Andes S M Co	Nevada	16	25	Feb 2	Mar 9	Mar 30	B Burris 309 Montgomery st
Belcher S M Co	Nevada	29	50	Feb 6	Mar 11	Mar 31	J Crockett 327 Pine st
Belmont M Co	Nevada	31	15	Mar 11	Apr 17	May 15	J W Pew 310 Pine st
Belvidere M Co	California	13	25	Feb 9	Apr 12	May 1	C V D Hubbard 310 Pine st
Benton Con M Co	Nevada	7	25	Mar 10	Apr 14	May 4	Wm H Watson 302 Montgomery st
Con Pacific M Co	California	4	25	Jan 28	Mar 3	Mar 27	F E Late 330 Pine st
Con Virginia M Co	Nevada	17	30	Jan 31	Mar 11	Apr 8	A W Havens 309 Montgomery st
Crown Point G & S M Co	Nevada	47	25	Feb 16	Mar 23	Apr 13	J Newlands 327 Pine st
Day S M Co	Nevada	10	50	Jan 28	Mar 6	Apr 3	E M Hell 327 Pine st
Equitable T & M Co	Utah	26	10	Feb 2	Mar 9	Mar 29	C J Collins 512 Montgomery st
Fall Creek M Co	California	5	30	Feb 16	Mar 24	Apr 19	W Willis 309 Montgomery st
Goodshaw M Co	California	10	10	Mar 21	Apr 22	May 11	C C Harvey 309 Montgomery st
Hale & Norcross S M Co	Nevada	73	50	M ar 14	Apr 1	May 10	J F Lightner 309 Montgomery st
Independence M Co	Nevada	9	15	Feb 24	Mar 31	Apr 24	E M Hall 327 Pine st
Iowa M Co	Nevada	16	03	Mar 8	Apr 15	May 6	O C Leavitt 411½ California st
Martin White M Co	Nevada	11	25	Jan 20	Mar 2	Mar 30	J J Scoville 309 Montgomery st
Mayflower Grav M Co	California	15	10	Mar 7	Apr 11	May 3	J Morizio 328 Montgomery st
McMillen M Co	Arizona	4	30	Feb 8	Mar 14	Apr 12	J Morizio 328 Montgomery st
Mexican G M Co	Nevada	18	1 00	Mar 13	Apr 15	May 9	C L McCoy 309 Montgomery st
Modoc Con M Co	California	10	30	Feb 14	Mar 28	Apr 25	J W Pew 310 Pine st
Mono G M Co	California	16	30	Feb 7	Mar 14	Apr 3	W H Lent 309 Montgomery st
Napoleon M Co	California	2	03	Feb 18	Mar 23	Apr 8	H Smith 339 Montgomery st
New York M Co	Nevada	27	15	Jan 18	Mar 7	Mar 23	F E Dietz 327 Pine st
North Gould & Curry G & S M Co	Nevada	2	20	Mar 18	Apr 19	May 11	C H Mason 331 Montgomery st
Ophir S M Co	Nevada	41	1 00	Mar 7	Apr 8	May 2	C L McCoy 309 Montgomery st
Pinal Con M Co	Arizona	2	30	Jan 24	Mar 7	Apr 3	W W Traylor 309 Montgomery st
San Jose M Co	Nevada	18	75	Jan 30	Mar 15	Apr 19	A Carrigan 109 Front st
Savage M Co	Nevada	50	50	Mar 7	Apr 10	May 1	E B Holmes 339 Montgomery st
Seg Belcher M Co	Nevada	21	1 00	Feb 14	Mar 20	Apr 10	G D Edwards 414 California st
Silver Belt M Co	Arizona	1	15	Mar 8	Apr 17	May 15	J W Pew 310 Pine st
Silver Hill M Co	Nevada	17	15	Feb 2	Mar 9	Mar 29	W E Dean 309 Montgomery st
Un'on Con S M Co	Nevada	19	1 00	Mar 21	Apr 25	May 15	J M Buffington 309 Montgomery st
Utah S M Co	Nevada	38	1 00	Mar 11	Apr 14	May 3	G C Pratt 309 Montgomery st
Yellow Jacket S M Co	Nevada	44	1 00	Feb 7	Mar 4	Apr 11	M Otey 327 Pine st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Bay State S M Co	Nevada	1	02	Dec 29	Mar 31	Apr 24	J W Pew 310 Pine st
Bed Rock M Co	Arizona	1	05	Feb 6	Mar 13	Apr 3	C H Graves 6 Post st
Caborca M Co	Mexico	5	30	Feb 25	Mar 29	Apr 17	W E Elliott 220 Sansome st
Equator M Co	——	—	20	Feb 27	Apr 11	May 9	Wm Willis 309 Montgomery st
Metallic M Co	——	—	20	Feb 27	Apr 11	May 9	Wm Willis 309 Montgomery st
Metallic-Equator M Co	——	—	20	Feb 27	Apr 11	May 9	Wm Willis 309 Montgomery st
Pinal Copper Co	Arizona	3	2 50	Jan 28	Mar 20	Apr 10	Geo T Shaw 840 Fourth st
San Pedro G & S M Co	California	4	03	Feb 27	Apr 3	Apr 27	W G Holmes rm 1, Sherman's build'g

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Marsland Con M Co	——	E P Farnsworth	219 Sansome st	Annual	Apr 6
McElroy G M Co	California	Lewis Lillie	607 Washington st	Special	Apr 17
Mellones Con M Co	——	J C Onghin	419 California st	Annual	Mar 28
Paris M Co	——	Wm J Taylor	310 Pine st	Annual	Mar 23
Windsor M Co	——	C E Elliot	327 Pine st	Annual	Mar 30

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willie	309 Montgomery st	10	Mar 13
Contention M Co	——	D C Bates	309 Montgomery st	25	Feb 28
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	60	Mar 15
Silver King M Co	Arizona	J Nash	315 California st	25	Mar 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Mar 13
Vizina Con M Co	Arizona	J E Haskel	30 Pine st	10	Jan 3
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10 (extra)	Jan 3

The Mining Share Market.

There are no specially enconraging features in the stock market to record. A dispatch from Virginia, dated the 22d, says:

About 250 tons of ore will be extracted from the 2500 level of the Union this week. The ore improves in breasting out upon it. There will be more room for the men next week, and a larger amount of ore will be extracted. The quality of the ore appears to he better as they work hack from the winze. The only place where ore is being extracted at the Mexican is the npraise from the drift on the 2700 level. The west crossent from this drift is still in material giving favorable assays. The joint Union and Sierra Nevada east winze is now almost down to the 2900-ft. level. It will reqnire four or five days to complete the Bullion hulkhead, as it is heing made very strong. The Jacket pump is still pumping, which manages to hold the water. The west cross-cut of Chollar on the 2400 level is showing some quartz ground which is dry. The Alta folks are drilling west from the face of the west drift of the 2150 level to guard against water.

On the 16th orders were issued to cease prospecting on the Yellow Jacket. Since the other companies would not now assist, the Yellow Jacket had nothing else to do bnt to stop. The water continued to rise with the pump rnnning at five strokes, and it wonld have been a nseless expenditure on the part of the Yellow Jacket management to have kept the pumps rnnning. By stopping they save $15,000 per month. They started up again at the instigation of the Bullion company, that company agreeing to pay all the expenses until they can get in their bulkhead on the 2200 level, which has a conecting drift between the Yellow Jacket and Bullion mines.

The joint Union Consolidated and Sierra Nevada east winze is within a few feet of the 2900 level. Another 100 ft. will place the Sierra Nevada and Union on an eqnal footing with the Yellow Jacket as regards depth. The same may be said of the Ophir and Mexican mines. In these north-end mines the sinking has been done in stages, and so gradually that few have thonght much about the great depth that has been attained. The whole series will soon he down to the 3000 level.

The Grass Valley *Union* says: Much of the rich specimen rock taken from the Ford & Mnllen mine is admirably adapted for jewelry, and within the past two weeks 50 lbs. of the rock has been sold to San Francisco lapidaries for $2,600. Some of the rock sold as high as $25 per oz., being more valnable than if it were solid gold.

It has been discovered that the two chief awards made by the Mexican Claims Commission, to the extent of $1,200,000, were obtained by perjury and frand, and the Secretary of State has stopped payment of the installment due at this time.

Improved Quartz Mills.

James Day, of this city, has just patented, through the Mining and Scientific Press Patent Agency, a new form of stamp, the object of which is to increase the force of stroke of the stamp without adding more weight thereto. The mortar, stamp, stem, tappet, arm, etc., are all as usual.

To the top of the frame are holted, or otherwise secured, brackets, to which is bolted a cylinder, in which is a piston. This, which may he an ordinary pump piston, is well packed within the cylinder by cup leather, kept moist and soft by oil or glycerine. The top of the cylinder is open, to expose the top of the piston to the atmosphere. Any other form of piston or packing may be used which is suitable to produce a vacuum within the cylinder.

To the top of the piston or its rod is secured hy a nut a cross-head, projecting on both sides. In its ends are fitted rods or bars, the ends of which are secured. These rods extend downwardly throngh appropriate guide notches or grooves in the cylinder base and brackets, and are provided with a cross-piece, to which their ends are secured hy nuts.

This cross-piece, or follower, is so placed that the the top of the stamp stem, when raised by the cam, will impinge against it and raise it up. In doing this, it raises the piston and creates a vacuum in the cylindcr. When the cam releases the stem, the pressnre of the atmosphere will drive the piston home, and the cross-brace, striking the top of the stem, will give the stamp a momentum much greater than it would have if allowed to fall hy its own weight.

This additional force is a matter of advantage, the inventor claims, because lighter stamps still have as much force in their stroke. The device is intended to be applied to a stamp battery, hut it is obvions that the same principle may he applied to any form of quartz mill whose object is to crush ore hy the action of stamps or heaters. The principle is to provide practical means for increasing the hlow of the heater.

The Bodie *Free Press* says: Davidson & Lockwood, of Sunshine, assisted by Geo. Storrs, an old Comstock expert in the reduction of tailings, have erected near the station a 16-foot water wheel, and put in a large pan for working Bodie slums. Their runs so far have heen satisfactory, and they will add another pan sometime this spring. These gentlemen have already expended hetween $2,000 and $3,000 on this enterprise.

One of the most pressing wants of Tombstone, says the Tombstone *Epitaph*, is reduction works for the treatment of smelting ores. The snpply of this sort of ores in Cochise county is practically unlimited. They are so varied in their character and so rich in the precious metals, independent of the commoner bases of copper and lead, that a system for their treatment cannot prove otherwise than highly remunerative.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

Bullion.—Monitor *Argus*, March 13: The Isabelle G. and S. M. Co. made two shipments of bullion last week, the first on Tuesday and the secood on Saturday. This speaks louder than words can express for the richneee of the ore in the Stella mine. Mr. Benalloch, a mioing expert from Grass Valley, was up and examined the Stella mine, belonging to the Isabelle G. and S. M. Co. We understand that he was well pleased with the prospects, and thinks the Stella a rich mine.

AMADOR.

Red Bank Gravel.—Amador *Sentinel*, Morch 16: On our return from the marble quarry, the other day, we made a short etop at the Red Bank hydraulic claim, owned and worked by a company compoeed of this following-named geotlemen: H. P. Gordon, J. W. Perry, J. Crane and Wm. Hynde. It is being vigorously worked, and though not yet fully developed, is paying modsrately; 250 inches of water and 650 ft of piping, with a fall of 140 ft pressure, which is forced through a No. 1 Giant nozzle, sweeps everything before it; 140 ft of the flume was cleaned up on the 8th instaot, which, we understend, resulted satisfactorily to the owners. We were informed that the extent of this claim is sufficient to employ the present force ten years to come, as the water supply will not permit of its being worked only about five months in the year.

The quartz in the Pacific mine, one would suppose, is very rich, as the eervices of a watchman is required to prevent the underground employes from carryiog it away in their pockets and dioner buckets.

Walton.—*Ledger*, March 18: This mine, in Hunt's gulch, is being worked with the energy which has characterized the present management. The tunnel is 540 ft, and a crosscut has been run 130 ft, prospecting for the ledge. The ledge has not heen struck, as yet, nor any ore body of any magnitude, except in the shaft, where the quartz is from 3 to 4 ft wide. The crosscut has not reached the point where it is expected to encounter the ledge, though it cannot be far off. The mill is about ready to start up, and there is plenty of rock on the dump to keep its 20 stamps in motion. Tom Earbart is the practical miner in charge of the miuing operatioua.

Gover.—The taking out of water from the shaft is progressing. The mine is pretty well filled with water, and it is thought it will require from two to three months to free it.

Miscellaneous.—For the first time this winter miners are rejoicing in having abundance of water. The liquid element is now ample for all mioing purposes.

Alps.—This quartz claim is located ono mile and o quarter southeast of Jackson. It has lately been purchased by C. Sumner and W. F. Deteret, who have since been quietly proceeding with its development. There is a shait 40 feet deep, with a well-defined quartz ledge, eight feet wide at the bottom. Tbie ledge has been uncovered by an exeavation varyiog from two to ten feet deep for a distaoce of 500 feet. In additioo to thie, above the shaft a hill rises a couple of hundred feet, 150 of which exhibits the quartz body oloug its surface, indicating that the ore reaches 200 feet in depth from the hill summit. As regards the quality of the quartz, it is said to prospect olong its entire length and in payiog quantities. Not a barren spot has been found. It is estimated that it will average from $6 to $8 per ton by mill process, without the sulphurets, of which it contaiue o heavy percentago, the sulphurets carryiog from $120 to $130 per ton in gold.

BUTTE.

Buck's Valley Quartz Mine.—Oroville *Mercury*, March 17: The Buck's Valley quartz lodo, owned by Messrs. Mathews, Pardee & Fitch, has heco bonded to San Francisco parties; terms unknown. This very valuable property has been well opened, and shows a well-defined vein from three to ten ft wide, the average assay being over $20 per ton. It is to be hoped that Buck's valley will soon ring with the music of a 20-stamp mill, and that a new era will be inaugurated in quartz mining in and about Buck's ranch.

CALAVERAS.

Jupiter.—Cor. *Mountain Echo*, March 14: W. A. Keefer, the superintendont of the Jupiter D ep Blue gravel mine at Dogtown, has at last, after an outlay of nearly a hundred thousand dollars, got the mine in operatioo. This is one of the most gigantic hydraulic mining enterprises ever undertaken in this county, and it is due to the skill and enterprising spirit of Mr. Keefer that the people of this section are indebted for whatever benefit may accrue to them through the working of the mine. Further particulars in reference to this mine will be given in future.

Black Oak.—Oehorn & Fisher, proprietors of the celebrated Black Oak mine, are steadily at work developiog their claim. In addition to the nine distinct veins mentioned in a former issue of this paper, aoother one has opened out in close proximity to the others. These ten veins are from two to three inches in width, and are separated by a kind of slate which carries gold in paying quantities. The deepest shaft is only about 30 ft deep, but the deeper down they go the richer the quartz becomes, and the more compact also. It is evident that before the shaft is sunk to any great depth, the small veins will concentrate and form a solid body of ore.

Sold.—Amos Everhart, of this town, recently sold an interest in o quartz mine near Vallecito, for the neat little sum of $2,000.

Notes.—The Potter, or Big mine, is said to be paying well. The lead continues about the same width, which, it will be remembered, has been stated to be 0 or 10 ft Norman Smith, of this town, while out hunting, the other day, picked up a piece of quartz containing about $15. Keyes and John Fletcher, of this place, are about to engage in a mining enterprise of considerable magnitude. They are now making the necessary preparations for opening the old Dickereon gravel mine near Bald Hill. This claim was worked in early days by Charles Dickinson, and it is said that an immense sum of gold was takeo out by him. The shaft io which the present owners intend starting is over 100 ft deep. A large whim for hoisting purposes will be erected. The Matsou Bros. are still eogaged in arostraing ore from the Brunoer mine, near Albany Flat, and the result of their labors, so far, has proved satisfactory. The average yield of the ore near the surface is from $4 to $5 per ton. The lead, if I.ad it cao be called, is simply immense, and nothing more or lese than a mountain of talc. This mine is supposed to be a continuation of the celebrated Dolan lead, and although the ore, so far as tested, is not of a high grade, the extraordinary facilities for working it, and the small outlay required to extract the ore, makes it one of the most valuable mioes in the county. James Matsco, who is a miner of large experience, speaks highly of the mine.

EL DORADO.

Grizzly Flat.—El Dorado county *Republican*, March 16: The Mount Pleasant is running, but not very full-handed; and the hope is not, as yet, realized of the grand boom anticipated when the new works were finished. Mr. J. E. Lyons is still driving ahead on the Driesbach mine, under the management of Mr. A. A. Gigoo, whose energetic work is highly commended, and it is expected to make quite a stir when the lowest level now being ruo for is reached, as all the quartz prospects *big*. Tbe shaft is down 150 ft, and is to be sunk 50 ft deeper.

Argonaut Mine Sold.—John and Thomas Smith, of Greenwood, half owners of the above mine, and holding the other half oo a bond, transferred the same last week to the Aultman M. and M. Co., for the sum of $50,000 cash. We have this information personally from John

Smith, who was in town and made us a pleasant call on Saturday evening. The parties chiefly interested in the new company are understood to be Eastern men, and will commence work upon the mine at once, and push further development as rapidly as possible, having purchased it as an investment, and with the intention of working it for all there is in it. If managed with reasonable economy and intelligence, by the aid of good machinery, and plenty of it, we are confident the purchasers will never regret their investment.

INYO.

THE MODOC.—Inyo *Independent*, March 18: During the past ten days the amount of ore delivered by Robinson's pack train to the Modoc furnaces at Lookout has been as follows: From lead mines, 43 tons of galena; from Black Warrior mine, 22 tons, and from the Modoc mines, 77 tons—making a total of 142 tons delivered so far. The car samples average 73 ounces silver. The Modoc ore is being hauled in carts. During the next week at least 120 tons more will be out and sacked for shipment. Frank Fitzgerald, the lessee, has 27 miners steadily at work, and says that the mines are all looking better at all points.

NEVADA.

GRAVEL IN THE WIND-UP CLAIM.—*Union*, March 17: The Wind-Up Gravel company, a Grass Valley organization, has been engaged for several years in driving a tunnel for a gravel channel, in the vicinity of Quaker Hill, and there is now a prospect that the labors of the company are about to be rewarded, as a letter has been received from the contractor who is at present driving the drift that he has struck a body of gravel 15 inches in depth, that first appeared in the top of the tunnel, but is now at the bottom, and gives every indication of its being the edge of the channel. The gravel at the bottom of the tunnel is blue, and there is a plentiful showing of black sand. The tunnel is now in a distance of nearly 1,050 ft. For some time the work of driving the tunnel has been in 50 ft contracts—the last 50 ft being in fair working ground, but the 50 ft preceding that was through very hard rock, which was to all appearance the vein or backbone that formed the side of the gravel channel. The stockholders feel quite encouraged at this news from the mine, as nothing had been heard in some time, as owing to deep snow and covered-up roads communication has not been regular with the mine during the winter.

AN IMPORTANT ENTERPRISE.—*Transcript*, March 10: The South Yuba M. T. Co. are operating extensively at Hoyt's Crossing, about five miles northwest of this city. A tunnel 14 ft wide and 8 ft high is being run through a point 630 ft wide that causes a big bend in the river. The enterprise was originated by a local company, who ran a tunnel 6x8 ft a distance of 180 ft, but were obliged to abandon the project and sell their interest on account of the heavy expense of penetrating the hill, which is of solid granite, and requires blasting the entire distance. The new company are in with their enlarged tunnel a distance of 35 ft. They are working 14 men, George T. Eager being general manager, with Skiff and William Murchie as foremen. There are four diamond drills and two machines for running them now on the way from the East. As soon as these arrive and are put in, a force of 30 men, divided in three shifts, will be employed, and work pushed with much greater rapidity than heretofore. It will probably take five or six months more to finish the tunnel. From the lower end of the tunnel a flume 30 ft wide, 6 ft high and 2,000 ft long will be built. A sawmill is to be erected in May for getting out the lumber that will be needed in constructing the flume. The sands of the river bed in that locality are believed to be very rich in gold. Some of the biggest hydraulic mines, such as the North Bloomfield, Eureka Lake and Milton, dump into the channel above the location. By diverting the water through the tunnel and flume, the river bed will be drained a distance of 6,200 ft, and can be worked at a nominal expense. The cost of getting ready to begin mining is roughly estimated at $60,000. Under Mr. Emery's economical and judicious management it will probably not exceed that.

PLACER.

THE CONRAD.—Placer *Herald*, March 18: The Conrad mine, on Duncan Hill, which was very thoroughly opened about a year ago by Roberts & Roberts, has been started up again under the superintendency of Mr. Wm. Roberts. Lack of funds compelled a suspension of operations by Roberts & Roberts last spring. They did a great deal of dead work for the sake of having the mine opened in good shape, but about the time they had finished their tunnel and were ready to begin the extraction of ore, some of their men closed down on them, and they were unable to proceed. There are the best of reasons for believing this to be a very good property. It has now started up with a backing, we understand, that insures its thorough working, and we shall not be surprised to learn soon of the realization of very satisfactory results.

SAN BERNARDINO.

MILL.—San Bernardino *Index*, March 18: E. Sommers shipped yesterday to Calico mining district the smokestack and other machinery for his five-stamp mill, which is now being rapidly erected; also a lot of lumber. Twenty-six thousand pounds of machinery are now waiting at the depot for teams to convey it to Calico. Mr. Sommers assures us that the mill will be in running operation by the fifteenth of April. It is the sole property of Mr. Sommers and will do custom work. The mill will be run for the present with only five stamps, but has a capacity for ten. The miners of Calico will hail with joy the speedy completion of the mill.

CALICO.—The S. P. R. R. has three miles of track laid and ten miles graded on the thirty-fifth parallel, from Mohave station to the Needles. At the Needles they will connect with the Atchison & Topeka end, leading from Santa Fe and Albuquerque to that point. The road is being pushed with energy, and the iron horse will probably reach Calico some time in July, which point will be about 480 miles from San Francisco, thus enabling contractors and others who purchase their supplies and machinery in San Francisco to receive them in Calico via this route as cheap, if not cheaper, than by the Los Angeles route. The line will run through near Black's ranch, passing near the Wells, a distance of two miles from Calico mountain, at which point Messrs. Earl & Garnett propose to sink a well and pump the water to the foot of Calico mountain, where a 20 stamp silver mill will be constructed at once by those parties. The mill will contain all the latest and most valuable improvements that can be made useful in such a structure. They expect to start the mill as soon as the first ten stamps are up. By the time the railroad shall have reached that point the mill will be ready to crush and test the different ores of the many rich mines of that section. This mill, when completed, will crush 80 tons of ore per day. The company propose to dry-crush and amalgamate in pans, settlers and mullers. Recently some very high grade ore has been developed in the Oriental mining group under the superintendency of Judge Walsh, which, it will be remembered, was sold by Messrs. Souther & Walsh to the present owners, Earl & Garnett, for $45,000. The ore from the King mine, adjoining this group, has been milled at the Oro Grande Mining Company's mill on the Mojave river, about 40 miles from San Bernardino, and also at San Francisco, milling from $130 to $416 per ton, free silver ore, and works 990 fine.

SIERRA.

WILL RESUME.—Truckee *Republican*, March 15: The Savage placer company will resume work in their mine in Sierra county at the earliest possible moment. They have on hand several thousand dollars' worth of provisions and supplies, and all they are now waiting for is the disappearance of the snow, or rather its melting away till there is no longer any fear of dangerous slides. The mine is situated about eight miles west of Webber lake, near the old Henness Pass road.

SISKIYOU.

NOTES.—Yreka *Journal*: The Yreka creek mining company's hydraulic elevator has been in operation occasionally this week, but the cold weather has choked up the water supply by frost, so that not more than 30 hours' run can be made at any one time. The Lime Oulch company expect to be at work taking out pay gravel in less than three weeks, the men being now busy at work getting the pumps and derrick wheels ready. By using Lime gulch water for the sluices, the company can take their time getting the dip wheel ready. The cribs are all right, and can be used again for the wheels. At the Centennial, Kanaka and other claims in the Klamath river, the cribs and head dams have not been damaged to any great extent by the recent freshet, as it was only of a few hours' duration, the river receding very rapidly, and it is now down to low-water mark again. The Centennial company intend reopening their claim in Klamath river at the earliest time possible, and preparations are already in progress. Their pit has been filled up completely with tailings from claims above, which will make the work slower in reopening, on account of being unable to cave the banks at start. Their old cribs are all right, and can be used to start an extension wingdam up the river to uncover new ground. Other companies are also getting ready, and expect to take out gold from the deepest claims before the 1st of June.

TRINITY.

WARD.—Trinity *Journal* March 18: O. M. Loveridge, superintendent at the Ward mine, on Oregon Gulch mountain, informs us that good work is being done in the mine this season, and that the ground shows as rich prospects as ever. We look for a good yield from this mine.

WILL COMPLETE.—John Whitmore will resume work on his new hall at once and push it to completion. He this week received a quantity of material for interior finish and decoration from San Francisco. When finished, this will be one of the largest and finest halls in northern California.

MR. JOHN YULE, superintendent of the Lewiston Co.'s mines, was in town this week and gave us a call. We are pleased to learn that the hydraulic elevator is doing even more than was expected of it, and that the ground now being worked prospects well. Mr. Yule anticipates a large clean-up in about a month.

ALL the hydraulic mines in Weaver Basin are now running on full time and with plenty of water. Indications are now more than ever favorable for an average season's run.

INDIAN CREEK.—During the last few storms there has been sufficient rainfall for the miners to get enough water to commence sluicing. Mr. J. A. Johnson is running his hydraulic claim of late; he uses about 2,000 miners' inches of water and this with 200 ft pressure causes debris to travel down Indian creek at a rapid rate. This mine is worked very successfully under the management of James Bowie, who is a thorough, practical, hydraulic miner. Mr. C. A. Sorr, of Igo, Shasta county, made us a short visit a few days since; from him we learn that he has one of his rotary pumps in operation on North Fork of Cottonwood creek, and that it works very satisfactory. The use of this pump, which can be run either by steam or water power, is for raising water on elevations that cannot be supplied with water by means of ditches; and also for working low bars that cannot be drained otherwise than by the use of a pump; and says that the expense of mining in this way is very small compared with digging long ditches. On Tuesday, 28th ult., about 10 A. M., Martin O'Keefe while working his claim, on Spring gulch, was thrown from a bank 20 ft high on to the rocks below and badly bruised, by the ground giving way beneath his feet.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.—*Enterprise*, March 20: On the 2500 level the winze in east crosscut No. 2 has been sunk and timbered 10 ft. North drift No. 2 has been extended 20 ft, and east crosscut No. 5 has been advanced 6 ft. The main north lateral drift has been advanced 32 ft. On the 2700 level No. 2 drift hole has been extended 175 ft, and the joint Union Con. east winze has been sunk 10 ft.

UNION CON.—On the 2700 level east crosscut No. 1 has been extended 27 ft. In the main lateral drift have completed timbering up and cutting out drain. On the 2500 level are preparing to stope out ore. During the week 163 tons and 1060 lbs of ore have been extracted from the 2500 level.

YELLOW JACKET.—Since last weekly report the water in mine has reached a point 107 ft above the 2300 level station. The pumps were stopped on the 16th inst, but were started again yesterday afternoon at the request of the Bullion M. Co., that company agreeing to pay the cost of running the same until they complete a dam they are employed building on the 2200 level of their mine. Since starting the pumps again the water has remained at the same level.

CALIFORNIA.—On the 1650 and 1750 levels are still cleaning out and repairing drifts and winzes connecting with the old Con. Virginia shaft. On the 2700 level are timbering up the joint C. & C. drift.

CON. VIRGINIA.—A small force is still employed in cleaning out and repairing the drifts and winzes on the 1650 and 1750 levels which connect with the old Con. Virginia shaft. On the 2500 level are cleaning out south drift No. 2 preparatory to resuming work.

OPHIR.—On the 2900 level the main south drift has been advanced 13 ft, and is now being timbered up. Are repairing the main incline and the joint California east crosscut on the 1700 level.

MEXICAN.—On the 2700 level the main north lateral drift has been extended 28 ft. In the main south lateral drift have completed the drain and the work of cleaning up. On the 2900 level the main north lateral drift has been extended 25 ft. During the week 45 tons and 1800 lbs of ore have been extracted from the 2700 level.

BULLION DISTRICT.

STOPING.—Lewis *Herald*, March 15: From Mr. James Lovey, the foreman and part owner of the Lady of the Lake mine, in Bullion district, we learn that a force of men are at work stoping out ore. A tunnel will be run on the ledge from the lowest available point, and the mine opened up right away. The company are negotiating for the Nutmeg mill, situated on Indian creek, and distant about 3 miles from the mine. As soon as arrangements are completed the mill will undergo a thorough overhauling and the ore from the mine will be worked. Considerable ore from this mine has been reduced at Salt Lake and Eureka and proved rich, some working as high as $900 per ton. The Nutmeg company have let a contract to J. C. Latta to run a tunnel 100 ft on one of their claims in Campbell district, and if the prospects justify they will do considerable work during the coming summer.

CHERRY CREEK DISTRICT.

A NEW BONANZA IN THE STAR.—White Pine *News*, March 18: We learn that an important strike has been made on the 270 level of the Star this week. The ore there discovered is said to be the richest ever found in the mine. The extent of the new find is not yet fully determined, but it is believed to be a good-sized body, as a large amount of virgin ground, thought to be rich in mineral, lies in the direction where the discovery was made. We are also informed that the water in the shaft which has given so much trouble of late is now fully under control. The pump recently got from the Egan Co. is now at work and handles the water very effectively. A wonderful mine is the Star. In the past three years it has produced over a million dollars, all of which came from the grass roots. If its owners possessed either energy or enterprise, and opened it out as they should have done, it would to-day stand second to no mine in the State. We have been shown a sample of the ore from the new find. It assays $300, and our informant says the ledge, which is 3 ft wide, has been penetrated 60 ft, all the way in the same kind of ore, and at present it is unknown how much further it extends. This is glorious news for the Star people, as well as the residents of this town.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, March 18: The sinking of the main shaft has reached a depth of 100 ft below the fourth level. At this point a station will be put in, on which the work is now being done. The daily output of ore has been about 53 tons. Both mills are running as usual and are doing the regular amount of work. Shipments of bullion for the week ending March 16th amounted to $14,663.43; the total on March account to that date being $29,480.28.

MOUNT DIABLO.—The stopes from the east and west drifts on the third level are looking well. The stope on the second level, near the center of the mine, continues to open well and shows a body of very fine ore. The mine as a whole is looking very well indeed. Shipments were made on the 11th and 14th inst., amounting to $8,018.72 and $6,272.96 respectively.

GENERAL JACKSON.—This property is still producing ore of a very good grade, the ledge yielding about a ton a day to the man. As soon as a further development is made more men will be put at work.

EAST MOUNT DIABLO.—The drift from the Mount Diablo shaft into the ground of this company is going ahead rapidly and has attained a length of 54 ft. Good progress has been made so far, the ground being of a character that breaks well. Everything is looking favorable.

CORTEZ DISTRICT.

LOOKING WELL.—Cor. Lewis *Herald*, March 15: The mines of this district are looking very well at present. At the Garrison, owned by S. Wenban, they are taking out the usual quantity of high-grade ore, and keeping the 10-stamp mill running steadily. They have not shut down since a year ago last November, only for the necessary clean-ups and repairs. At present writing there is a good showing of rich ore in both inclines, and a large body of a lower grade in the upraise, which will not probably average much over $100 per ton, but what it lacks in quality it will make up in quantity. Griswold & Walsh have a lease on the old workings of the Garrison and are taking out some very rich ore. They have made one shipment of first-class ore and have several tons of second-class on the dump, which they expect will go $200. John Ralls and his partner have lately made a rich strike on a mine they have leased from H. Hughes, situated on Bullion hill. Another valuable mine owned by Hughes, and adjoining the above, is lying idle this winter, as his health is too poor to work it. I understand some Mexicans prospecting at Granite Springs have also found rich ore. S. F. Griswold has resigned the superintendency of the Garrison mine, and D. C. Lane has been appointed to fill the vacancy. S. Wenban has lately put in an air compressor and two Richmond drills, and is working the mine with compressed air instead of Cbinamen. Some difficulty was experienced with the drills at first and break-downs were of common occurrence, but now they are running all right and give good satisfaction.

GARFIELD DISTRICT.

IN LUCK.—Candelaria *True Fissure*, March 18: A very rich prospect was uncovered at the new camp west of McDonald's, in Garfield district. George Box and his partners have developed their location only about 0 ft in length and 3 ft in depth, but have found ore assaying $3,800 per ton. This is excellent encouragement to continue the work.

GOLD PARK DISTRICT.

MILL.—Grantsville *Bonanza*, March 11: Supt. M. San Pedro came in from Gold Park, on Wednesday, and returned on Thursday. He reports everything moving steadily at the Park. The mill works like a charm and the mines continue to improve as work progresses. Work progresses as usual in the mines at Gold Park with the most encouraging results. In the course of a few days an important connection will be made in the Star of the West which will very much facilitate the working of the mine. The mill runs along nicely and does good work; as soon as the weather becomes warmer the other 5 stamps will be dropped which will greatly increase the bullion output. The first shipment of gold from this mill was valued at $3,760.

LEWIS DISTRICT.

OUTLOOK.—Lewis *Herald*, March 15: The mining outlook for the week past has been rather gloomy, owing to the shutting down of the Highland Chief mine, and work temporarily suspended in other mines, though we hear that work will be resumed shortly with the exception of the Highland Chief mine.

STARR-GROVE.—The south drift from the 300 level has been extended 14 ft during the week—total distance in, 32 ft. The ledge is large, with bunches of rich ore scattered through it, with a slight improvement from last accounts.

CHLORIDE.—The main tunnel on the Chloride mine is now in 530 ft with no change in the character of the ledge. The walls are well defined and the flow of water is increasing.

SUN BEAM.—The winze from the lower level of the Sun Beam has reached a depth of 77 ft, and the ore carries considerable black sulphurets. Last reports from the mine are to the effect that the ore is increasing in richness as greater depth is attained.

MORNING STAR.—No work has been done on the Morning Star with the exception of some timbering, as the force are employed in sacking ore and keeping the trails cleared of snow. The ore is packed on mules from the mine to the forks of Lewis canyon, and owing to the late storms is necessarily a slow process.

BETTY O'NEAL.—The stopes in the Betty O'Neal are still yielding the usual quota of ore, and from all appearances will continue to do so for some time to come. The south drift from the lower level still improves and some very rich ore is being extracted therefrom.

ARIZONA.

TYNDAL DISTRICT.—*Citizen*, March 14: Messrs. J. B. Oregg and Frank Cazy came in from Tyndal district last evening. They brought in specimens of spleudid looking ore from the Laura mine, now being opened by the Surprise M. Co., a portion of which will be subjected to a mill test in San Francisco. The Laura shows an immense ledge, with fully 3 ft of high grade, free milling ore. No crosscutting has been done, and the width of the ore body is yet undetermined, but the mine is evidently a very extensive one.

ST. LOUIS CO.—The incorporation of the Oro Plata, Third Term and Florida mines, for $5,000,000, has recently been completed at St. Louis, Mo., with Mr. James Edwards and Geo. S. Foster, of that city, and David Armstrong, of Tucson, as the leading stockholders. Mr. Armstrong will act as superintendent, and expects to commence active operations on the property in a short time.

PIONEER.—Arizona *Democrat*, March 15: There are at present about 150 men employed in Pioneer camp, in the various mines, mostly upon the South Pioneer and its road building. This mine is improving with every day's development. The drift from working shaft is in 110 ft, placing the face 10 ft beyond the former workings and 50 ft underneath, developing an ore body wider, richer, more uniform, and with every evidence of permanency. It is stated that several old miners on the Silver King, familiar with all its inns and outs, unhesitatingly say that the King is the only mine which can compare with the South Pioneer. The drift alluded to will be run 225 ft to the northeast corner of the mine, and is expected to control all of the surface water. At present this drift is draining the former working from 18 to 20 inches daily, and the pump handles the balance in every 4 hours out of 24. From the drift has been already placed on the dump 150 tons of ore, very rich.

MONTANA.

CONCENTRATOR.—*Inter-Mountain*, March 14: A 50-ton concentrator is soon to be erected to treat the ore from the Shakespeare Parrot, a copper property in which very important developments have recently been made, and which is now shipping considerable ore. It is under lease to John Longmaid & Co.

MOULTON.—Everything is running smoothly at the Moulton, though much trouble has been experienced with the mill boilers, which were riveted in a most unworkmanlike manner, reflecting anything but credit on the party or parties who furnished them. At an expense, however, of $500 they have been thoroughly repaired, and are now as good as they should have been when new. They were manufactured by Griffith & Wedge.

BELL.—In the 200 level of the Bell yesterday morning an upraise disclosed a body of ore which developed a width of 4 ft. It samples over 40% copper, and is literally white with native silver. The strike is a rich and important one, and will add still more to the increasing productive capacity of the Bell. The Bell smelter is booming along in good shape, and the stopes in the 200 and 300 levels of the mine are daily increasing in productive capacity.

THE incline shaft on the Shonbar, on which sinking has been lately resumed, is producing good ore. A few thousand dollars expended in development will show the mine to be one of the richest in the district.

PROSPECTORS are already starting out on their hunt for precious metals. Every day, now, since there has been a crust, little squads of 2, 3 and 4 men, drawing a handsled loaded with tools and provisions, may be seen leaving town for the hills. The main tunnel being driven in the Eureka mine, to connect with the Idahoan workings, is in about 500 ft, the breast being in tolerably hard ground.

NEW MEXICO.

THE SHARESPEARE SMELTER.—*New Southwest*, March 11: The lead furnace at Shakespeare has now been running successfully for a period of 2 weeks, and, in that short time, has produced about $60,000 worth of lead and silver bullion. They shut down this week for the lack of iron ore. The company proposes immediately to erect roasting furnaces, where all classes of ores can be treated. This company expects to purchase from miners such ores as it would not pay for the latter to mill, but which, by smelting, will yield them a profit of $3 to $5 per ton. The smelter is now under the superintendence of Messrs. Hiertz & Oruebling, both experienced smelters from the Kansas City smelting and refining works. The owners of the furnace are prepared to treat all ores that are brought to them.

THE SUPERIOR MINE.—The Superior mine, at Shakespeare, which I. N. Cohen, of this town, sold to Jamee E. Carroll, and of which Mr. Carroll sold a one-half interest to an Eastern company, is being steadily developed. The main shaft on the hill is 182 ft in depth, by actual measurement. This shaft is tapped or intersected by a tunnel at the bottom of the hill, which is 232 ft long. It is on the ledge and shows copper all the way. The ore, as all our readers know who are familiar with this mine, is copper, carrying small quantities of silver and gold, but in bunches that are very rich, which, however, it would not pay to work. There are about 1,000 tons of ore on the dump and at the smelter—300 tons being on an average of from 15% to 20% carbonates and oxides. The copper furnace is ready to run, and Mr. Carroll informs us that the only thing lacking is iron ore for a flux. At this writing he is in town, and, after an inspection, thinks he has found, in the neighborhood of Silver City, the quality of finxing ores he requires. The capacity of the copper furnace is 30 tons, and is controlled and run by the same company that runs the lead smelter. This company will do something generally smelting for customers.

THE Silver King, in the Bullard's Peak district, a claim bought by Mr. Henderson from Black & Sullivan, is developing beyond expectations. Two prospect shafts are being sunk, one down 15 and the other 10 ft. In the latter a vein of ore has been followed down that will assay from $500 to $10,000. This vein is improving as it goes down. The other shaft has a vein 2½ to 3 ft of fair milling ore. Out of the 10-ft shaft fully 6 tons of rich ore have been taken this week.

THE force on the Sherman mine is being gradually increased as openings are made where miners can work to advantage. The superintendent informs us that he is now sinking a new main working shaft. The ore body looks splendidly.

IDAHO.

SAWTOOTH.—Yankee Fork *Herald*, March 10: W. H. Casto and Tim Cooper are in from Vienna, Sawtooth district. They report everything in the mining line looking favorable, and predict a big boom in that section early in the season. The Mountain King M. Co. has purchased the machinery for a 20-stamp mill, which will be in as early as June. Grading on the mill site will commence soon as the weather will permit. There are about 25 buildings completed in Vienna. Mr. Mulock came in from Stanley Basin with Messrs. Casto and Cooper. The journey was made on snow shoes. The days are quite warm and the snow settling. The nights, however, are a little chilly. One night this week the thermometer registered 10° below zero.

STRIKE.—Idaho *World*, March 15: Craig Baird tells us that the strike made in Berry's location, about 6 miles southeast of Squaw creek, is as good as was first reported. The vein contains both gold and silver, the latter predominating. Work was suspended some time ago on account of the difficulty of getting timbers to the mine, the snow being about 2 ft deep. Craig advises prospectors not to make a break for that district before April.

SIX men are at work in the Belshazzar mine, on Canyon creek. Eight hundred tons of ore have been taken out during the winter. The rock, which is mostly decomposed, will be put through sluices. Ore is being extracted at the depth of 140 ft from the surface. The ledge is all the way from 3 ft to 10 ft wide. The ore averages well. It is fair milling rock from wall to wall.

THE Sub Rosa tunnel—the lower one—has been driven in 55 ft past the small vein that was tapped a few weeks ago. It is now in very hard rock, which is believed to be the casing of the main ore.

OREGON.

SQUAW LAKE.—Jacksonville *Times*, March 17: Henry Klippel, Esq., returned from the Squaw Lake Ditch Co.'s mines this week. He informs us that the reservoir is now being completed and the ditch cleaned out, preparatory to earnest operations. We expect to hear of some good clean-ups there this year.

CLEAN-UP.—Chas. E. Chappel & Co., of Star gulch, made a clean-up last week, realizing 31 ounces of dust, which is considered flattering under the circumstances. The "giant" became displaced just before starting in, or the showing would be still better.

WATER.—Piping continues at the Sterling mine with a fair supply of water. The weather has been so cold high up in the mountains that very little snow is melting, and the ditch is consequently not full. This company will be able to run until late in the summer, as there is much more snow than usual.

SNOW.—The occasional showers of the past week have been very beneficial to miners, and, if they continue a while longer, a large amount of the glittering dust will be unearthed in spite of the unfavorable winter, for the miners are not losing an available moment. The deep snow in the mountains will also be of great advantage.

WORK has been suspended on the diggings of Bybee, Newman & Hawkett, near Waldo, owing to some misunderstanding, though the ditch is also broken. Excellent reports were expected from there, as the ground is good.

WE LEARN that Logg & McDonnell have suspended operations at their mines on Jackass creek, claiming that they are disturbed by an unusual amount of tailings coming down that stream this season.

UTAH.

CARBONATE.—*Southern Utah Times*, March 4: The Carbonate mine, at a depth of 525 ft, looks better than ever. At the bottom there is a large, fine body of ore, and in quality a great improvement on that found in the upper levels. Competent judges estimate that there is ore enough in sight to keep the smelter running 2 years. If this mine, which is clearly demonstrated to be a true fissure, does not loom up as a rival of the great Ontario, we are much mistaken. Work is being developed on the Charlotte mine with flattering prospects. The ore looks well and it is expected that it will carry silver soon.

FRISCO.—The signs of the times indicate a mining boom for Frisco in the near future, which for generality, extent and grand results, will eclipse anything of the kind that has ever taken place in Southern Utah. It is evident to the most casual observer that the end of the long lane of disappointment is now in sight. The great Pilgrim mining claim has at last brought to light the long sought for mother vein of San Francisco mining district.

Pocket Mining and Nuggets.

Under these headings may be embraced those erratic occurrences of gold which are a mystery to the miner and prospector and a puzzle to the scientist. The finding of nuggets in alluvial places is no uncommon occurrence. Such nuggets vary in weight from half an ounce to many ounces, and are usually worn smooth from water action and the attrition of the rocks of the stream in whose current they have been carried. Usually they bear traces of the quartz, which was their original matrix, and sometimes they consist of nearly one-half quartz, thereby denoting their origin, and, by inference, the origin of all gold found in a natural state. It is proposed, however, to notice here only the occurrence of free gold in veins.

Gold found in its native state in the mines of California is always in the form of an alloy containing some silver. Its specific gravity ranges from 13 to 19½ and its fineness from 600 to 950. The average value is usually a little more than $16 per ounce, which corresponds to 800 in 1,000 parts. As an ore it is found combined with iron sulphides and with tellurium, in the former mechanically and in the latter it is believed chemically, though there are strong reasons to doubt the latter theory. That gold primarily existed in a matrix of quartz scarcely admits of a doubt, but it is also true that it exists in rocks other than quartzose—such as in talcose slate and in iron sulphides permeating slates and schists. In the former case it seems to be the result of mechanical deposition after removal from its home in the silicious rocks; in the latter case it exists in such small quantities as to be appreciable only by fire assay, but not in sufficient quantity to prove profitable for extraction.

There is no example in California of a mine successfully and continuously working gold-bearing rocks which are not quartzose in their nature. The so-called porphyry belts in El Dorado county are merely fissures filled with rotten and decomposed rocks, into which the gold has been mechanically deposited.

Prof. Joseph Leconte, the eminent California geologist, holds that all metalliferous veins have been deposited from hot alkaline waters, circulating through fissures, and that in the case of auriferous veins the solvent of the gold was sulphate of iron, and the sulphate was deoxydized by organic matter in the same solution, the gold and the iron crystallizing at the same moment, one as metal the other as sulphide, so that, although gold exists in the iron sulphide of the unchanged vein only in minute and sometimes microscopic crystals and threads, it occurs in the decomposed portion of the vein, above water-level, in visible particles and often in nuggets; hence, he infers that the larger aggregations result from the coalescence of the minute particles originally contained in a mass of sulphides. In support of this theory it may be stated that the occurrence of free gold in the veins of California diminishes in depth and that the deepest mines are the poorest in specimens or pockets; the Idaho, or Grass Valley, now worked to a depth of 1,000 ft., and yielding about $500,000 per annum, having produced less than $100 per annum in specimens for several years past.

There are two varieties of the telluric ores known to mineralogists, the sylvanite or combination of gold with silver, and the nagyagite or combination with lead, silver, and copper. The former exists abundantly in Calaveras county, in the vicinity of Carson hill, and in Sierra county, between the north and south forks of the Yuba river. In the former locality it occurs in slate rocks, and in the latter at the junction of slate and serpentine. Nagyagite is not known to exist "in place" in California, though samples have been obtained of this ore, but it has been impossible to trace them to a ledge formation.

The ledges carrying sylvanite in both the above-mentioned localities seem to be favorable to the aggregation of large masses of native gold in proximity to the telluridcs. At the Morgan mine, on Carson hill, $110,000 was thrown out at one blast. The gold held the quartz together in ribbons, and cold chisels were used for its extraction. Residents estimate that the mine yielded $2,800,000 in the years 1850 and 1851, and since that period the discovery of pockets has been of annual occurrence in this formation.

The telluride veins of Sierra county, extending from Minnesota to the South Yuba, have also been prolific of pockets or aggregations of gold. The Fellows mine on this belt yielded $250,000 from this source, although the telluric ores were not successfully worked by any process.

Aside from the telluride veins the most notable pocket localities have been in the vicinity of Grass Valley, Nevada county; Auburn, Placer county; and Sonora, Tuolumne county. In all these localities the occurrence of pockets has been in quartz rock running in veins through metamorphic slates, and in almost every instance the discovery of the pockets was the result of accident or chance, though they are sometimes systematically sought by the prospector, who, however, in this class of mining has no better theory than that expressed by Job in Holy Writ, "Surely there is a vein for the silver and a place for the gold where they find it."

It is a singular fact that the native gold so liberally diffused in the quartz should be confined to nests or pockets of limited extent, but of great richness. The continuity of the pocket deposits in depth has been disproved wherever they have been sought; in fact, in most cases, native gold seems to have its origin in gash or surface veins, rather than in true fissures. Near Auburn, in Placer county, the "Green Emigrant" was discovered by chance within 100 ft. of a road traveled for 20 years. The discoverer was an emigrant who had never seen a mine. The gold occurred in its metallic condition, associated with rotten quartz in a slate formation. It was readily extracted by pan and hand mortar. After yielding about $160,000 a mill was erected, but no more pay rock was found.

The "Reece pocket" of Grass Valley contained $40,000, and was worked out in less than a month by hand mortar. Another famous pocket in that district was discovered by a casual visitor who was there in search of health, and who had never seen gold in any other form than the coin of the commonwealth. This yielded $60,000, when all traces of the precious metal were lost, though much money and labor were devoted to further search. In one instance a smooth nugget containing $640 in gold was picked up in a garden path used for many years by the occupant of the premises. There was no ledge in the vicinity. This piece was about half gold and half quartz.

Both the above-named districts, however, contain mines of permanence, where the pay has been regular and steady in true fissure veins of 1,000 ft. in depth, which are still yielding.

Sonora, in Tuolumne county, is another famous pocket locality. Bald mountain, near that place, is a hill of talcose slate permeated with narrow seams of quartz in which pockets varying from $10,000 to $40,000 have been found for many years past. They are soon worked out and others sought. The most celebrated pocket mine of the present time is the "Devol" mine of Sonora, situated only a few feet from the main street of the town. The company, consisting of three partners, took out over $200,000 during the last year without works or

A GOOD PROSPECT—"A NUGGET."

mill. Half of this amount was taken out in a period of three weeks. The veins are narrow and the gold of erratic occurrence in nests and benches. This company is still prosecuting its search, but in more systematic manner, by deep sinking.

Pocket mining continues to be an element in the production of the precious metals, and doubtless many pockets as rich as those discovered await the miner's pick and shovel. The business is precarious, but it has a strange fascination incident to its uncertainty and the sudden reward attending success. The pocket miner's "outfit" is simple and inexpensive. It consists only of a few days' rations of "grub," and pick, pan, and shovel. With these the prospector enters on his campaign and returns to headquarters only when his provisions are exhausted. The most favorable time for his search is after a rain-storm, as the surface is cleared and the rock exposed. Every crevice presenting quartz indications is panned, and when colors are found a trench is run, following the vein, and sinking prosecuted wherever the vein shows richest in gold. Where the metal is much diffused a Mexican arastra is erected on some convenient stream and the decomposed quartz and slate wheeled to the arastra, which usually runs by water power, and though slow in action is very effective as a saver of gold.

The suction fans, now in use on the Comstock—one at the Bonner, one at the old Consolidated Virginia, and a third at the Sierra Nevada shaft—are proving very valuable aids in ventilating the lower levels.

A site has been selected in the upper part of Missoula gulch, Montana, for the erection of the second 40-stamp mill of the Lexington company.

John T. Bradley, of Carson, recently sold two mines in Santa Fe district, Esmeralda county, for $60,000.

On Minerals.

[Notes of a Lecture delivered before the Mechanics' Institute by A. W. Jackson, Jr., Instructor of Mineralogy, Petrography and Economic Geology, at the University of California.]

(Continued from Last Week.)

Metals.

Of the known metals eight occur rarely and seven not uncommonly in the native state. The more commonly occurring metals are arsenic, bismuth, copper, silver, mercury, gold and platinum. Mineralogically, there is little to be said of them. Like the metallic salts, they are confined to the upper portions of ore veins, and for the *same reason*, viz: they result from the reduction of some other ore of the same metal, with the exception of *gold*, which seems to be deposited at once in the metallic state when first formed.

Gold and platinum also occur in what are familiarly called "placers," but in every such case they have been derived, of course, from some other deposit.

Thiometallites.

The last of the ore orders, is the extremely important one of metallic sulphides. The minerals of this family hold much the same relation to those of the first three ore families, that the sclerites hold to the zeolites, and hydrolites.

They are, namely, the primitive or original ore minerals from which most of the metallic salts, oxides, and native metals are derived by secondary decomposition, that are confined mostly within a comparatively narrow zone, close to the surface of the earth.

For several metals the sulphide or "sulphuret" ores are of the first importance from the economic standpoint; thus: Lead glance for lead; copper pyrites for copper; smaltine for cobalt; nickelite for nickel; cinnabar for mercury; zinchlende for zinc. Chemically, the minerals of this order consist mainly of sulphur, arsenic or antimony, combined with one, two or more of the heavy metals. Sometimes the chemical composition is very simple, as in galena; at other times six or eight different elements occur in the same mineral, as is often the case with the fahl ores. If we turn now to the physical properties, we shall find that the greater number occur with a brilliant metallic lustre and color, yellows and grays being predominant. The conditions of their formation are such that we frequently meet with most exquisite crystal forms, which, of course, are different for every different species, and which assist greatly in determination. On the other hand, they also occur in enormous bodies of massive or compact material quite free from crystals. These masses are made up either of one single mineral, like iron pyrites or copper pyrites, or, as is more frequently the case, of an intimate mixture of several. Thus, the bodies of ore known as the "bonanzas," on the Comstock lode consisted mostly of galena, silver glance and stephanite.

I have already indicated the geological occurrence of these ores as being below the oxides and native metals on ore veins in general below the "water line," and from here downward they persist to indefinite depths.

They are also found less commonly in ore beds, interstratified in the crystalline schists and sedimentary rocks, and rarely disseminated in the massive crystalline rocks.

This order is conveniently subdivided into three families, named after the most commonly-occurring mineral in each family: Pyrites or pyritis, galenitee or glaucee, cinnabsrites or blendes.

I will mention in a few words the distinguishing characteristics of each family and give the leading minerals of each.

In the first family are comprised all of the sulphides, arsenides and antimonides of the hard, magnetic metals—iron, nickel and cobalt. Some copper and silver minerals are included, but in every case iron enters largely into the composition, while in the other two families the soft, non-magnetic metals appear. The luster of all is brilliant metallic; color, yellow, white, red, and all are very hard and brittle. One can strike fire with pyrite.

The most common members are pyrite, the commonest iron compound in the order, and, until quite recently, the most worthless. Iron is now made from it in England to the extent of £50,000,000 annually. Mispickel, the white metallic sulfarsenide of iron, is sometimes met with in our California gold veins, and is always dreaded.

The red and white nickel ores, from which most of the nickel of commerce is obtained, and smaltine, the leading ore of cobalt, belong here; likewise, two important copper ores, peacock copper ore and copper pyrites, both of which occur in this State in sufficient quantities to form some day the basis of a thriving copper-producing industry.

Glances.

The glances likewise possess metallic lustre, but the colors are the dark grays and blacks instead of the light yellows, and whites of the preceding family. Copper, lead and silver are the principal metals combined with sulphur, arsenic and antimony.

Copper glance is an important ore of copper, while another copper mineral, viz.: Fahl ore is highly valued for the silver which it almost invariably contains. It is the principal silver ore in the Blind Springs district, Mono Co., Cal.

The richest silver ores belong here, viz.: Argentite or silver glance, silver copper glance, and brittle silver ore. These are the silver minerals that one invariably reaches, sooner or later, on silver veins (to which may be added, perhaps, the ruby silver ore of the next family). While there is a large number of lead minerals in this family (18) only one is of value, viz.: Pb S and that of the greatest value for Pb.

Come West, Young Man.

The Arizona *Democrat* says: If nature has endowed you with some energy, a fair amount of "grit," a modicum of common sense, a willing hand and a not too sluggish head, come West! If you are willing to earn your bread in accordance with the fore-ordained destiny of man, come West! If you are willing to take your chances in the fierce and eager race for wealth and distinction among the young, active and enterprising element of the frontier, come West! If you are prepared to fight the battle of life, and have the nerve and staying qualities that can snatch victory from the jaws of defeat, come West! If you are the happy possessor of a light heart that can smile at fate and take the whips and scorns of outrageous fortune serenely, come West! If you have a good constitution, an honest heart and a not too elastic conscience, come West and grow up with the country. You may, perhaps, think that we are asking for too many good qualities and natural gifts in a young man from the East. We are aware that it is difficult to find many who will fill the bill, but we are also aware that these are the qualities that command success in a new country. They are qualities to some extent native and to the Western manner born. They are the rule and not the exception among the young, active, go-ahead spirits of the border, and he who is deficient in them had better not enter the lists for fame or fortune in the far West.

We claim that to-day there is not a finer field on the globe, for the display of every attribute that goes to make a man, than the Western States and Territories. The doctrine of the survival of the fittest here finds its truest exposition; merit and true manhood here finds recognition and appreciation. The youth who was born with a silver spoon in his mouth is treated with no more consideration than his plebian neighbor who had to be content with an iron one. Men are placed upon their natural level, with a fair start in the race of life, and the goal is first reached by him whose pluck, and bottom, and staying qualities are the best. So, young man, if you think that nature has equipped you with the gifts that will enable you to hold your own in the rough-and-tumble fight for fortune on the distant frontier, by all means, come on. We will give you a hearty welcome, a fair start and a good send off. You will find a country worthy of your best efforts, and a people not slow to acknowledge them. You will find a land with grand resources, blessed with a perfect climate, and endowed by the Creator with every natural advantage to make a great and prosperous State. So, come, be one of us, take your share in our grand heritage, cast your lot with our future, and take part in the glorious fruition of our hopes, so near at hand. Turn your steps to a region, the sun of whose future greatness, just rising above the horizon, is shedding its golden beams over valley, mountain and mesa, and whose midday splendor will cover with a blaze of glory this favored land. Come to Arizona, the mineral monarch of the Western world, which will yet become—

"The State of every State the pride,
Beloved of Heaven and all the world beside."

The Alta has put in a new blower to furnish more air for the lower levels, which have been very hot, and is better prepared than ever to work the mine.

A Triumph of Engineering.

The Work on the Hoosac Tunnel.

The Hoosac tunnel, with all the delays, mistakes and disappointments connected with it, is a grand achievement. It is one of the great works of our time. Already 20 passenger and as many freight trains pass through the tunnel daily. Every morning through this gateway of the Green mountains roll the cars whose wheels, the evening but one before, began their revolutions at St. Louis, beside the Father of Waters. More than 300 cars daily carry their burden through this new avenue of transit. Following to a great extent the line of the natural water-courses on the route, the easy grades thus secured cheapen the cost of transportation from California and Dakota, from the cornfields of Illinois and the wheatfields of Minnesota to Massachusetts bay, and a cent less of freight on each bushel of grain or barrel of flour means millions of dollars saved to the consumers of bread in New and in Old England.

Enormity of the Work.

If for nothing else the tunnel would be worthy of notice as a triumph of engineering. Some may think that it was only a question of Patrick with his drill and plenty of gunpowder and time; and that to go through a mountain is no more than to go through a hill, or a short rock cutting, except that the process is lengthened with the distance. But "time is money." It would take 50 years to go through the Hoosac mountain, beginning at any point on one side, and burrowing to the other. We could not wait for that. No one, not even a State Government, would put capital into a work the end of which was to be reached only after half a century. So the tunnel must be begun at more than one point. Here, at once, is involved a nice problem of engineering. Working simultaneously from opposite sides of the mountain, it is no longer Patrick burrowing through by whatever zigzag course he may chance to take, but these tunnelings from opposite sides must be so directed that they shall finally meet, and fall into an accurate line of adjustment. How shall this be done? As any one can see, who gives the matter a moment's thought, a slight deviation from the mathematical line required would cause the two arms of the tunnel to miss each other. The width of the tunnel is 24 ft. It is only necessary, therefore, for the approaching excavations to swerve from their true place at the point of expected junction by anything more than half that measure, or 12 ft., in order to slip by each other, and go farther asunder, instead of coming together. Who will measure and set the angle which shall determine the momentous difference in such a case between success and failure? The tunnel is to be nearly five miles long. Each channel from the opposite sides of the mountain will therefore be nearly two miles and a half in length.

Delicate Calculation Needed.

The problem, then, is to run two lines of excavation through a mountain, with no visible point in front to aim at, as the engineer has in the open field, and yet to have them so nearly coincident in direction for a distance of 12,000 ft. each that they will not miss each other, but form one continuous whole. No Creedmoor rifle needs to be aimed so nicely in order to hit the bull's-eye. No allowances for wind to swerve or the power of gravitation to draw down the ball from its proper course render the marksman's problem so difficult of solution as the engineer's in this case. An error in the sighting of his instrument amounting literally to a hair's breadth would send the arms of his excavation wide asunder into the bowels of the dark rock, leaving his tunnel no tunnel at all, but only a worm's track in the mountain. But the problem in this instance was still further complicated. To hasten the completion of the tunnel by providing additional faces on which the workmen could operate, as well as for the purpose of ventilation, it was determined, as we have seen, to sink a shaft from the top of the mountain to the level of the tunnel, midway between the two ends. Two factors were thus at once added to the problem: First, to fix so accurately the point on the mountain at which to begin the downward excavation that when, after working by faith for four years, the estimated time necessary, the miners should have reached the requisite depth, they would be in the exact line of the projected and partly completed tunnel; and, secondly, from that pit in the depths of the mountain, to be able to aim their course in either direction so correctly as to be sure of meeting the company of miners approaching them from both extremes of the tunnel. In short, here were four tunnels to be made at the base of the mountain at one and the same time, another from the summit perpendicular to them, and all to be exactly in the same plane, on penalty of the failure of the entire enterprise! It was a difficult problem. But it was solved most triumphantly. When the headings from the central shaft and from the eastern portal came together, as come together they did, their alignments swerved from each other by the almost infinitesimal space of five-sixteenths of an inch.—*The Atlantic.*

THE Virginia and Gold Hill Water company says it is ready to lay another pipe from the Sierras to Virginia if any more hydraulic pumps are wanted. To lay the pipe would cost well on to $500,000, yet they are willing to take the chances on the lode.

Useful Information.

HOW TO BUILD A STORAGE WAREHOUSE.—A storage warehouse, to be absolutely safe, should, in the first place, be entirely detached. It should be built around a court, and the windows, protected by iron shutters, should all face inward, and be as few and as far between as is consistent with needful light. The building should be in many sections, being subdivided by strong brick walls, the necessary connections being by double iron doors—that is, by doors with a space of at least a foot between them. The court-yard of the building should be provided with several hydrants, and, in a shed adjoining, a fire engine, with an engineer always on duty, should be placed, the still further protection of electric communication with the fire department being provided. Each floor of the building should be furnished with a hydrant with hose attached, and the floors should be so arranged as to be slow burning, if not made of fire material. The roof also should be fire-proof in character. Were these features of construction embodied in a building of the general character above indicated, the community would be justified in feeling that goods stored within it were as nearly safe from such disasters as overtook the Morrell warehouse in this city recently as is possible in the present state of the arts. With the constant and increasing demand for storage, we think, as a business enterprise, the erection of a building entirely safe would prove a profitable investment.

REMOVING MILLSTONE GLAZE.—The Fry process for taking off the glaze of millstones, which was so much talked of a few years ago, was as follows: First the burrs must be put in perfect face, well dressed, out of wind, and in the best possible condition for grinding. They are then run a couple of hours until they become warm, taken up, and washed with aqua ammonia in the following manner: Take four ounces of aqua ammonia (spirits of hartshorn) and thoroughly saturate the stones with a good sponge, and let them stand over night. By doing this once a week, or oftener if necessary, the glaze will be kept off. His second method was to take two ounces each of borax, washing soda and muriate of ammonia, and dissolve them in a quart of warm water; then add cider vinegar. Now cover the stone with sand, and apply the solution with a sponge. Leave it on 10 minutes, and then dry the stones thoroughly. This is said to harden the burrs so that nothing, not even garlic, can glaze them, and they will retain their natural temper and grit for weeks, and will not glaze.—H. W. MILLER.

HOW TO DISCOVER SEWER GAS.—I purchased several ounces of essence of peppermint. Late in the evening I went to the fourth story, turned on the water from the hot-water faucet for several minutes, and then, allowing the flow of hot water to continue, poured the essence into the outlet from the basin. Returning to my library, I inquired from my wife if she noticed any peculiar smell in the house. She said, "No." I requested her to go to the kitchen and ask the same question. She did so, and immediately one of the servants exclaimed: "Why, I was just telling Ellen that there was a smell of peppermint candy in the kitchen." The next day, with my plumber, repeating the experiment, and tearing up the cellar bottom, we found a crack in the soil pipe. I understand the Health Department of this city has within a year to two adopted this mode for detection of sewer gas.—*N. Y. Post.*

TO PREVENT SPERM OIL FROM GUMMING.—If kerosene oil is added to sperm oil it will prevent the latter from gumming. Mix thoroughly 100 parts of oil with 4 parts chloride of lime and 12 parts of water. Now add a small quantity of the decoction of oak bark to destroy all traces of gelatinous matter still remaining, and allow the impurities to settle. Next agitate the clear part with a little sulphuric acid; settle once more and remove the acid by washing, and see to it that none of the acid remains. If the oil shows any signs of becoming rancid, it ought to be boiled with water and a little bicarbonate of magnesia for about 15 minutes, when it will likely lose the power to redden litmus paper.

THREAD FROM WOOD.—The manufacture of thread from wood for crochet and sewing purposes has, it is said, recently been commenced in the middle of Sweden. It is wound in balls by machinery, either by hand or steam, which, with the labeling, takes 1 minute and 12 seconds, and the balls are packed up in cardboard boxes, generally 10 in a box. Plenty of orders from all parts of Sweden have come in, but as the works are not in proper order, there has hardly been time to complete them all. The production gives fair promise of success, and it is expected to be very important for home consumption.

CORN (MAIZE) GRINDING.—There is probably no better method of reducing (grinding) corn than with a pair of ordinary millstones. The dress usually adopted in the West where a 4-foot stone is used has 12 leading furrows with 4-inch draft; 12 second furrows, laid off from a circle 12 inches in diameter, and 12 short furrows laid off from a circle 24 inches in diameter. The furrows are deep at the back, feathering out to the front, and leaving a light catch at the edge of the land. The lands are cut at an angle of 45 degrees with the draft and about 1-16 of an inch apart.

A NEW CEMENT FOR JOINING LEATHER and other materials is now being introduced into England by the proprietors of the Morris Patent Engineering Works, Birmingham. The article is called dermatine, and is made from a peculiar preparation of the intestines of animals by a special process worked in Austria, the material being imported into England for the finishing process. Owing to the elasticity of the dermatine, the joints are as pliable as the other parts of the belt, while it is stated that the tensile strength of the cemented joints has been shown by tests to be equal to that of the entire leather. Dermatine is melted and applied the same way as glue, and a considerable saving is effected as against joints made by means of mechanical fastenings.

WATER-PROOF COATING FOR BRICK.—Two solutions are necessary, the first composed of one pound of castile soap in a gallon of boiling water; the second, of two ounces of alum to a gallon of water. Apply the soap solution first, let it dry 24 hours, then apply the second, thus alternating until three or four coats each have been applied. The soap solution should be applied at a boiling head; the alum solution at 60° to 70° F.

CLEANING WHEAT.—Shears, a student of modern milling, concludes that wheat should not be handled too tenderly in cleaning. "In twelve years experience," he says, "I have never seen wheat overcleaned. No smutter using steel or chilled iron surfaces has ever scoured wheat too much, if unbroken. The brush is a great help, but it is not intended to take the place of the smutter."

DEMAND FOR LOCOMOTIVES.—The Baldwin Works have given the Pennsylvania Railroad Company an answer as to the time in which the order for 60 locomotives placed with them by the latter company can be completed. The time fixed is the 1st of July, and the Pennsylvania Railroad Company will build 210 locomotives at its own shops during the year.

WEIGHT OF AIR.—A cubic foot of air weighs 538.1 grains, or something over 1 ounce; 13.06 cubic ft. weigh one pound. About 65 cubic ft. of air furnish 1 pound of oxygen. An apartment 8 ft. high, 12 ft. wide and 13 ft. long contains about 100 pounds of air: and a room 40 ft. square and 18 ft. high contains about a ton.

PAINT FOR BRICK WALLS.—A cheap paint is made for brick walls by simply mixing up good hydraulic cement in water. The natural tint is neutral and pleasing, but may be readily varied. This paint cannot be washed off by storms, nor peeled off by the sun.

IT is said that there are upward of 3,000 steam-plowing machines now employed in England and Scotland.

Good Health.

A Commercial View of Life and Death.

The London *Sanitary Record* quotes a recent writer on vital statistics who calculates that of 10 children born in Norway, a little over 7 reach their twentieth year; that in England and the United States of America somewhat less than 7 reach that stage; that in France only 5 reach it, and in Ireland less than 5. He tells us that in Norway, out of 10,000 born, rather more than one out of three reaches the age of seventy; in England, one out of four; in the United States, if both sexes be computed, less than one out of four; in France, less than one out of sight, and in Ireland less than one out of eleven, and he adds this significant computation, based on what may be called the commercial view of the vital question: In producing dead machinery, the cost of all that is broken in the making is charged to the cost of that which is completed. If we estimated by this same rule the cost of rearing children to manhood, if we calculate up the number of years lived by those who fell with the years of those who passed successfully to manhood, there would be found between the two extremes presented in Norway and Ireland—both, be it observed, unnatural—a loss of 120% greater in the first year of life, 75% greater in the first four years of life, and 120% greater in the years between the fifth and the twentieth, in Ireland than in Norway. In Norway the average length of life of the effective population is 39, and rather more than a half, years, in England 35½ years, in France not quite 33 years, and in Ireland not quite 29 years. Thus, again comparing the best with the worst of a scale of vitality, in which both are had, in Norway the proportion of the population that reaches 20 survives nearly 40 years, or four-fifths of the effective period, to contribute to the wealth of the community; while in Ireland the same proportion survives less than 29, or considerably under three-fifths of the effective period.

PERFUMES AND OZONE.—It is discovered that perfumes exert a healthy influence on the atmosphere, converting the oxygen into ozone. Cherry, laurel, clove, lavender, mint, juniper, fennel and bergamot develop the largest quantity of ozone. Flowers without perfume do not develop it, but the flowers of narcissus, mignonette, heliotrope and lily of the valley develop it in close vessels. Odorous flowers, cultivated in marshy places, would be valuable in purifying the air.

Hints about Eating Breakfast.

Having tested a number of meals in a general way, eating more or less each time, find out as near as may be what is the proper amount for a meal. Begin with a very light breakfast of ordinary food, such as you have been accustomed to, and note the number of hours you can go without feeling a want of more food. For a very light breakfast, say one roll, a cup of coffee and a very small piece of meat, three hours or less will be found the limit. This is not offered as a rule, but as a suggestion, for it makes a vast difference what you do in those three hours. A given amount of food will go farther in manual labor, as brain work is more exhausting than hand work. The next time try a little more, and in the course of a dozen breakfasts you will learn to judge pretty closely what you require to carry on your work till the hour of the next meal. Having found out just what you need, never on any consideration, take more. Never mind how nice the steak, how tempting any food may be, shut right down on the whole eating business the instant you have had enough. Too little can be repaired by eating a light lunch before the next meal. Too much cannot be repaired, and you must pay for the indiscretion. In all this there must be plain common sense. Do not imitate the invalid who kept a pair of scales on the breakfast table to weigh his daily bread. Eat and be satisfied, and then stop.—*Food and Health.*

SAND BAG FOR THE SICK-ROOM.—One of the most convenient articles to be used in a sick-room is a sand bag. Get some clean, fine sand, dry it thoroughly in a kettle on the stove; make a bag about eight inches square of flannel, fill it with the dry sand, sew the opening carefully together, and cover the bag with cotton or linen cloth. This will prevent the sand from sifting out, and will also enable you to heat the bag quickly by placing it in the oven, or even on top of the stove. After once using this you will never again attempt to warm the feet or hands of a sick person with a bottle of hot water or a brick. The sand holds the heat for a long time, and the bag can be tucked up to the back without hurting the invalid. It is a good plan to make two or three of the bags and have them ready for use.

VARIATIONS IN STATURE.—A contributor to the *German Militia Wochenblatt*, who has lately been employed in mustering and examining the recruits drafted into the German army, has established by a long series of careful measurements, not only that the hight of a man varies very considerably at different times of the day, but also that this variation takes place with great regularity in every individual man. The greatest difference in hight observed was an inch and a half.

SICK-ROOM.—Food should not be left in a sick-room, but after the patient has tasted of it remove it, if no more is wanted, immediately. Never keep it by the sick one with the hope that he or she may partake of it by-and-by.

THE EYES.—Avoid glaring and glancing lights in the rooms where you read, sit or write. Mirrors which strongly reflect the light in a room are very bad for the eyesight, and produce evil results at last. A very bright carpet, even, is bad for weak eyes. Use cold water freely in the morning after sleep.

RUBY-DUNDERBERG.—We notice that at the recent Ruby & Dunderberg Con. M. Co.'s meeting in London a very earnest disposition was manifested to place Mr. Rickard, late manager of the Richmond Con., in charge. The stockholders wanted a practical man at the head of affairs who understood mining in Eureka district. One gentleman said that if Mr. Rickard was going to be connected with the Ruby-Dunderberg, he would himself subscribe for one-half the proposed new issue of shares. This was an old shareholder in the Richmond Con. The following resolution was carried: "That the capital of the company be increased to £325,300, by the creation of 25,300 new shares of £1 each, to be called new shares, each new share to entitle the holder thereof to a dividend equal in amount with the dividend on each of the original £10-shares in the company, and the new shares, in all other respects, to give the same rights and privileges as the original shares." It was also resolved that the new shares were to be offered in the first instance to the holders of the original shares, in the proportion of one share for each original share held, and any new shares not taken up may be allotted by the Directors to such persons, and on such terms, as they may see fit. The new shares are to be paid for at such times and by such instalments as the Directors may determine. Mr. Rickard was present at the meeting, and in answer to a question said that, if he had charge of the mine, he would do the best he could to make returns to the stockholders.

THE mineral discoveries on the upper Pecos, N. M., are attracting considerable attention.

AN old Spanish mine has been discovered in the Ladron district, northwest of Socorro, N. M.

THE flow of water from the mouth of the Sutro tunnel is 6,824,631 gallons in 24 hours.

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SAN FRANCISCO:

Saturday Morning, March 25, 1882.

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California Iron and Steel Company, S. F.
Vulcan B B Powder, Vulcan Powder Co., S. F.
Lithographing and Printing, Schmidt & Co , S. F.
Leather Belting, H. Royer, S. F.
Pipe Joint, Francis Smith & Co., S. F.
The Pacific Business College, San Francisco.

Passing Events.

The beautiful weather of the latter part of the week is a fitting conclusion to the rainy prelude, for the warmth following the moisture will set everything growing luxuriantly, and before we know it, spring is upon us. While we hear of heavy snow storms in the mountains, we know that, unpleasant as they are to experience, the result will be a good supply of water for miners' use the coming season.

This week we issue a double edition of the MINING AND SCIENTIFIC PRESS, and give special prominence to the prospectore, or class of men to which the Pacific coast owes more than to any other, being as they are the pioneers in all the new regions, and opening the way for capital to follow and develop the resources.

As we go to press the good news comes that the Chinese Bill has passed the House by a vote 177 to 65. The debris question still remains undecided here. Almost any day now Judge Temple's decision may be expected, and it is awaited with anxiety.

MINERS and prospectors are not doing much in the Black hills, northeast of Prescott. Mr. Jacoby and the Minges brothers went there recently and found snow six ft. deep on top of the range.

Production of the Precious Metals.

An Abstract of the Census Monograph on the Bullion Output of the Country.

First Paper.

The Government printing office at Washington will shortly issue a monograph upon the production of precious metals in the United States. Although published first, it will form the concluding chapter of a forthcoming volume devoted to the technological aspect of the precious metal industry. That volume will contain an elaborate discussion of the distribution of precious-metal mines and their methods of exploitation, together with abundant data on the mechanical, chemical and metallurgical processes employed in the industry, all classified and treated from a statistical point of view.

The general direction of this branch of the census inquiry was committed by the Superintendent of Census to Hon. Clarence King, then Director of the United States Geological Survey.

For purposes of convenient administration, he divided the United States into three leading divisions:

The division of the Pacific, consisting of the States of California, Nevada and Oregon, and the Territories of Arizona, Idaho, Utah and Washington; an area made up of the States and Territories bordering on the Pacific ocean and the political divisions of the Great Basin. The leading reason for this arbitrary grouping of political divisions is that they are for the most part tributary to the great mining center of San Francisco. A very large portion of the capital employed and of the personal ownership center in San Francisco, which is also the source whence the greater part of the mining machinery, appliances and materials are drawn.

Personnel of the Pacific Division.

The headquarters of this division was placed in San Francisco, and the direction of the work confided to Mr. Geo. F. Becker, U. S. Geological Survey, geologist in charge of the Pacific division.

Mr. J. M. Cunningham, for the eastern portions of Washington and Oregon, and the northeastern part of California.

Mr. J. S. Curtis, Nevada, south of the line of the Central Pacific railway.

Mr. J. H. Hammond, central and eastern counties of California.

Mr. D. B. Huntley, Utah, southwestern Nevada and portions of California.

Mr. H. W. Leavens, the tract lying west of the Cascade and Coast ranges in Washington, Oregon and northern California.

Mr. Walter Nordhoff, southeastern and middle Arizona.

Mr. H. W. Sander, Western Arizona.

Mr. Luther Wagoner, southern California.

Mr. Albert Williams, Jr., Idaho, Nevada north of the Central Pacific railway, and the Comstock lode.

Personnel of the Division of the Rocky Mountains.

The division of the Rocky mountains adjoins the division of the Pacific on the east, and extends eastward as far as the 100th meridian, including the State of Colorado and the Territories of Dakota, Montana, New Mexico and Wyoming. At the head of this division was placed Mr. S. F. Emmons, U. S. Geological Survey, geologist in charge, with headquarters at Denver.

Mr. W. B. Fisher, portions of Lake, Chaffee, Clear Creek and Gilpin counties, in Colorado, and Beaverhead county, in Montana.

Mr. Wm. Foster, Montana and Wyoming.

Mr. J. E. Hardman, the smelting works in Lake county, Park and Summit counties, and portions of Clear Creek and Gilpin counties, in Colorado.

Mr. Charles Cotter, New Mexico.

Mr. E. H. Schaeffle, Dakota and portions of Colorado.

Mr. W. G. Sharp, San Juan, Hinsdale, Gunnison, La Plata, Huerfano, Ouray and Rio Grande counties in Colorado, and portions of New Mexico.

In addition to the census experts, the following-named gentlemen acted as temporary assistants: Messrs. Herman Garlichs, J. C. Hine, H. B. Price, H. L. Simmons and W. H. Whittlesey, in Colorado, and W. F. Wheeler, in Montana.

Personnel of the Eastern Division.

The eastern division comprises the whole territory lying east of the 100th meridian. Prof. Raphael Pumpelly, U. S. Geological Survey, was placed in charge, with headquartere at Newport, R. I.

Mr. Geo. H. Eldridge, Southern States and reduction works east of the 100th meridian.

Prof. N. S. Shaler, with the assistance of Messrs. Joseph M. Wilson and J. E. Wolff, New England States.

To each of these three chiefs of division was committed the responsibility of choosing his own assistants, who were in due form appointed by the Superintendent of Census as special experts.

All the leading precious-metal districts of the United States were visited by the corps of experts, and their observations were entered in the field upon a uniform system of printed schedules.

The following list shows the number and character of reports returned, which form the basis of the statistical tables in this publication:

Deep mines	1,967
Placer mines	325
Amalgamating mills, concentration works, chlorination and leaching establishments	327
Smelting works	86
Arastras	25
Total number of reports	2,730

The entire work of compilation and tabulation has been performed under the personal direction of Mr. Albert Williams, Jr., special expert in charge of compilation. Mr. Williams was formerly connected with the MINING AND SCIENTIFIC PRESS, and was well qualified for the task, as the result shows.

Method Followed in Compilation.

Three principal methods have been adopted by statisticians in studying the bullion production of the United States.

The first and most obvious plan has been to use as a basis the receipts of domestic bullion reported by the several Mints and U. S. Assay Offices, ascertaining the probable total product by adding to the figures thus obtained the amount shipped abroad, as shown by the Custom House returns, and the probable amount consumed in the arts. The objections to this method are, the amount coined within a certain period does not necessarily correspond to the production for that period. In the same way the proportion of the domestic product exported may be largely affected by the stock of precious metals on hand at any given time. Both of these variations depend primarily upon fluctuations in the bullion market and international balance of trade. An average of a long series of years would give tolerably accurate results, but for any stated period the figures of coinage, export and consumption in the arts are apt to be deceptive.

Assuming the source of the bullion deposited at the mints to be correctly stated, there are still serious and unavoidable defects in the custom-house statistics, notwithstanding the care taken to secure accuracy. No account is taken of bullion transported overland into Canada, nor are the export figures for dore bullion, base bullion, ores and matte shipped abroad always to be depended upon. This difficulty is particularly manifested in the last three instances. The regulations prescribed by the custom-house authorities are not followed by penalties sufficient to insure accurate invoicing of the values thus exported. It is well known that during the period of intense speculation in gold a very large proportion of both receipts and exports even of gold coin was entirely hidden from official scrutiny, with a still greater margin in the bullion movement; and although the inducements to a concealment of the actual movement do not now exist in the same force, it is still doubtful whether the official figures are entirely reliable. A less important source of error is the undisputed fact that not infrequently bullion of domestic production, after having been shipped abroad, is, from changes in the silver-bullion market or from the necessities of coinage, reimported into the United States.

It will thus be seen that the best results which can be hoped for from the most careful application of the "consumption and export" method are close approximations extending over considerable periods, but not the exact product for any given year. The system also fails to segregate the yield according to the productive source; and while the geographical distribution by State and Territorial lines may be shown, it is hardly possible to carry the analysis further and ascertain in this way the yield of single districts or even counties.

The Director of the Mint has examined the bullion product of the country critically from the "consumption and export" point of view, employing as a supplementary means of information the details obtainable by correspondence and circulars scattered through the mining districts. The substantial accuracy of the estimates of the total production thus reached has been fully borne out by the results of the present investigation.

The second, or "transportation," method consists in estimating the product from the statistics of the express companies, freight lines, and banks which have the handling of the product from its original sources. This plan would give more satisfactory results if, in the first place, all the bullion, ores, etc., were transported from the producing points through these different channels alone; and if, in the second place, none of the product were reshipped from point to point, and thus twice recorded. As a matter of fact, there is a considerable portion of the gold yield sent through the mail as registered matter, and a large proportion passes from the productive source into the market through private channels. Both of these means of conveyance are affected by proximity to main lines of communication; or, on the other hand, by the absence of express or railroad facilities; and in neither can the exact effect of these circumstances be very definitely counted upon. In the Pacific States and Territories, the great bulk of the mine output is handled by Wells, Fargo & Co.'s express, and upon the detailed returns of the many offices of this company, Mr. J. J. Valentine, General Sup't, has been enabled to furnish very valuable estimates of the bullion production, covering a long series of years. The business connections of this express company in portions of the country not covered by their agencies have rendered it possible for Mr. Valentine to frame approximate estimates of the product of the mining territory outside of that from which Wells, Fargo & Co. are the principal transporters of bullion.

(TO BE CONTINUED.)

Forms of Locations for Prospectors.

We append a few forms for taking up claims under the United States mining law, each one of which explains itself. They will be found useful to prospectors, as they can make out their notices before leaving camp, filling in the blanks when on the ground:

Notice of Location.

Notice is hereby given that the undersigned, having complied with the requirements of Chapter Six of Title Thirty-two of the Revised Statutes of the United States, and the local customs, laws and regulations, has located —— linear feet on the —— lode [twenty acres of placer mining ground], situated in —— Mining District, —— County, ——, and described as follows:

[*Describe the claim accurately (by courses and distances, if possible,) with reference to some natural object or permanent monument, and mark the boundaries by suitable monuments; if a placer claim is located on surveyed land, describe the legal subdivision.*]

—— ——, Locator.

Discovered ——, 188-.

Located ——, 188-. Recorded ——, 188-.

Attest: —— ——.

NOTE.—Record of location notices, in absence of a District Recorder, should be made with the proper recorder of deeds for the county wherein the claim is situated. It is advisable to have these notices attested by witnesses, for locatore cannot be too careful about their evidence.

In re-locations to increase width of surface ground under the local law, or to more particularly identify or describe the claim, use the above form, but state after the description that it is a re-location, and in addition, where the original location is recorded, in order that the title may revert back to the original discovery.

In locations of abandoned mines, the fact that it is such a location should be stated, and the affidavits of two or more respectable parties that such mine was abandoned and subject to re-location should be recorded with the location notice.

Where the location is by agent, that fact should be stated after the name of the locator, thus: By Thomas Jones, agent (or attorney).

Proof of Labor.

—— of ——, County of ——, ss.

Before me the subscriber personally appeared ——, who being duly sworn says that at least —— dollars' worth of labor or improvements were performed or made upon [here describe claim], situated in —— mining district, —— county, —— of ——, during the year ending ——, 188-. Such expenditure was made by or at the expense of —— ——, owners of said claim, for the purpose of holding said claim.

[Jurat.] —— —— (Signature).

NOTE.—The record of an affidavit like the above is *prima facie* evidence of the performance of such labor.

Notice of Right to Water.

The undersigned claims the water running in the —— stream to the extent of —— inches for mining purposes, to be conveyed by (ditch or flume) from this point to the —— placer claim.

—— ——,

Dated ——, 18—. Locator.

NOTE.—This notice is to be posted near the outlet, and the following form is to be duly recorded in the district or county recorder's office.

Pre-emption of Right of Way for Ditch and Location of Water.

To whom these presents may concern—know ye, that I, ——, of the county of ——, in the State of ——, a citizen of the United States, do hereby declare and publish as a legal notice to all the world, that I claim and have a valid right to the occupation, possession and enjoyment of all and singular, that tract or parcel of land lying and being in the county of ——, in the State of ——, for the exclusive right of way for the purpose of constructing a flume or water ditch from —— stream to —— placer claim, more particularly described as follows: Commencing [Here describe the exact route for ditch or flume.]

I also claim and have a valid right to the enjoyment and use of —— inches of water from said stream for mining purposes, to be conveyed through such flume or water ditch to said claim, together with all and singular, the hereditaments and appurtenances thereunto belonging, or in anywise appertaining.

Witness my hand and seal this —— day of ——, A. D. 18—.

—— ——

[*Name*]

Notice posted on the stream ——, A. D. 18—.

Ditch commenced at claim or at stream ——, 188-.

—— of ——, county of ——, ss.

On this —— day of ——, 188-, before me, a —— in and for the county aforesaid, in the State aforesaid, personally appeared ——, to me personally known to be the person who executed the foregoing written instrument, and acknowledged that he executed the same for the uses and purposes therein set forth.

Witness my hand and official seal.

—— ——.

OVER 10,000 people are working directly and indirectly in Montana Territory on the line of the Northern Pacific.

MONTANA people expect an addition of 30,000 to their population this season.

Foundry Notes.

Centrifugal Pumps.

Perhaps no class of machinery has undergone a greater change and improvement during ten years past than centrifugal pumps. Only ten years ago they were regarded as a wasteful kind of water-raising engine that had nothing to recommend them except the absence of valves and cheapness of first cost, but now we find them competing in economy with the best appliances of other kinds in Holland and elsewhere, where low lifting is done.

The economy of centrifugal pumping has been mainly due to English engineers.

There are now three firms whose main business is the construction of such pumps, and as before remarked, the "coefficient of effect" has been steadily raised, until investment, and all things considered, it is doubtful if any other system can compete for lifts of 30 feet or less.

The pumps of commerce, that is, those made for sale, irrespective of the duty to be performed, are, of course, imperfect machines, and cannot be expected to attain economic results. The pumps must be arranged to suit the hight of the lift, and otherwise to meet the requirements of particular cases.

By examining the circulars relating to centrifugal pumps and the rated capacity, the area of suction, discharge, and so on, it will be seen that in many cases it will take from 30 to 40 pounds pressure per square inch to propel the water through the pipes. This is all wrong. The rating of pumps by the English firms referred to is about one-half what is claimed by the makers in this country, or to state the same another way, the orifices and ducts for inlet and outlet are twice as large. The exponent of capacity for a centrifugal pump is the area of the suction pipes. Water flows into a vacuum at the rate of 40 ft. a second in a straight pipe; 30 ft. is working limit, so that anyone may compute the true capacity of a centrifugal pump from this factor. The economy of working is, however, another matter. This depends upon a number of conditions, to notice which would exceed the extent of our present remarks.

On April 9th of last year, the PRESS noticed the centrifugal pumps made by the San Francisco Tool company, of this city. Since that time the company has executed a contract with the city of Sacramento for machinery to lift the sewage and surface-water at that city, and has proved the value of its methods of construction such pumps. From computations by Mr. L. F. Bassett, City Engineer at Sacramento, the duty performed was equal to more than 10,000,000 gallons per diem with a pump of the following dimensions: Area of foot-valves, 200 inches; area of suction pipe, 175 inches; area of discharge, 150 inches; area of out-put pipe, 300 inches; speed of pump (maximum), 275 revolutions a minute.

From such data as a common working test afforded, the effect produced is estimated at 65%.

The whole plant, including an extra expensive steam boiler, has cost (exclusive of buildings) less than $6,000, and this we regard as the most remarkable feature in the case.

The pump was of the vertical or straight line type, from designs by Mr. Richards, the Superintendent. The rotor, as explained in our previous article, is wholly unlike any constructed by other makers, being nearly the same as a turbine water-wheel inverted—that is, the curves reversed and made theoretically to the form that meets the conditions of action—paraholic curves. Another feature of these pumps before noticed is a water space between the runner and casing. This is, so far as we know, a new departure from all practice, including the English firms, who have gained such high results with plain paddle-runners. There is, no doubt, much power lost by friction, and there is also no doubt but this friction is lessened by a stratum of water of some depth, instead of a mere clearance.

The company has recently supplied a pump of about 6,000,000 gallons capacity, to be used on Rough and Ready island, in the San Joaquin valley. The working effect, we cannot speak of at this time, but we have no doubt it will meet the expectation of all concerned.

We headed our former article, "A New Home Industry," and we once more call attention to the value of such machinery for reclamation and irrigation, with the further remark that this industry here bids fair to excel both Eastern and European attempts in the important matter of economy.

It may be as well to supplement the preceding remarks by some extracts from the Sacramento *Record-Union's* interviews with Mr. Bassett, the City Engineer. A very fair test of the value of the arrangement was made when the entire sewage of the city for eight days, including a rainfall of more than two inches, was discharged from the city in what would be less than 24 hours' running of the pump to its full capacity. The sewage and drainage is all discharged into a lake, during the time the waters of the river are high, and from this lake the pump forces it into the river.

During the short time that the pump was run in this way, the sewer pipes in the lower part of the city, which had become almost entirely filled with a deposit of mud from having an insufficient outlet, were nearly cleansed of the deposit and very much relieved. The general arrangement by which the above results have been attained is substantially as follows: From the end of the sewer-pipe at Sixth and V streets, a ditch has been cut through an old slough to Eighth and Y, connecting with the lake. The lake has been connected with the pumping works, where a pit or sump has been put in, over which the pump has been set. This pump is run by what would generally be rated at about a 50-horse power engine (from 50 to 100), however, will not make any practical difference in the amount discharged by the pump, the resistance under such circumstances being only about one seventy-fifth part greater. By having the pump arranged in this way we avoid raising the water several feet higher than is necessary during low water, to let it fall back again; that is, we avoid requiring the water to "march up hill, and then march down again," as a certain French army did in olden time. The pump is so built that it is very durable, and can be placed in constant service for a number of years, needing only slight repairs, those parts that are most subject to wear being easily and cheaply replaced. Quite large substances can pass through the pump without injuring it; in fact, almost anything that would be brought to it in the sewage. In this connection it may be interesting to note that at the time the pump was first started up a large quantity of catfish were pumped out of the lake and discharged into the ditch on the outside of the levee, several hundred of them being caught by the boys and Chinamen who happened along at that time. Most of them were as large as those usually sold at the markets.

"OFF ON A PROSPECT."

SNOW SLIDE.—A dispatch from Bodie, dated the 20th, says: John I. Ginn, J. C. Kemp and John F. Keating came in from Lundy on snow shoes Sunday evening, and reported a terrible accident in Lake canyon as a result of the recent storm. On Wednesday night a snow slide occurred which buried several men, four of whom were killed. Their names are Robt. Trumbull, Alex. McKeon, D. B. Grant and Henry Schumaker, the three former miners and the latter a machinist and engineer, recently arrived from San Francisco, where he leaves a wife and three children. The bodies of all but Grant were recovered on Friday and left on the snow. During the night another snow slide occurred, and they were buried under 45 ft., where they now are. In all, upwards of 40 ft. of snow slides occurred in Lake and Mill Creek canyons between Wednesday and Saturday, and in all 38 people were buried in the canyon; and at Tioga district, where the great Sierra mining company is operating. The only serious injury done to any persons, except those heretofore stated, was to Christian Hahletzel, who was under eight ft. of snow 19 hours. He was alive Sunday morning, but little hope was entertained of his recovery. The snowfall in Mill Creek canyon averages six ft., and higher up in the Sierras eight to ten ft., and in the immediate neighborhood of Bodie about 4 ft.

THE AUBURN TRAMWAY.—District Attorney McMillan, who has had considerable experience in running tramways, went to the Auburn C. G. M. Co.'s mine, at Dun glen, last week, to assist in getting the new tramway in order. He returned late Saturday night, and reports everything in splendid order. The tramway is 3,029 ft. long, and extends from the mill into the mine. The ore cars are filled from a chute in the tunnel, and clutched to an endless wire cable, run by machinery at the mill, to the battery floor, where the ore is dumped. Considerable delay has been caused by the weather, which has been unusually severe, but every obstacle has been surmounted, and the mill will probably start to-morrow.—*Silver State.*

MINERS everywhere are at work with full supply of water, and good work is being done in every section of Trinity county.

A Prospecting Trip.

The engraving on this page depicts a scene familiar to most miners who have ever done any extensive prospecting. It represents a miner and his "pard" just starting off on a prospect, with a full outfit of tools, arms and provisions, and ready for anything. It is turn about to tow the old pack mule, and to ride. The drawing from which this engraving was made was done by the late Charles Nahl, a noted artist, who was, as a miner himself, familiar with such scenes, and its faithfulness any old prospector will attest.

Prospectors do not all have an animal to ride and a pack mule, too, by any means. Some of them only have a hurro to pack, and others "tote" their own grub. Most of them nowadays, where camps are plenty, go from day to day from their cabins, never staying away over night. But in newer regions, where distances are magnificent and the mineral range wide, a well-equipped prospector must take all his conveniences with him.

There used to be a legend in Arizona that, when a prospecting expedition was about to start out, and the mule was being packed, the crows and buzzards would come and light on the trees and fence near by, surveying the preparations with complacency and commenting mentally on the physical condition of man and mule; it was only a question of time when the whole outfit would come to the crows and buzzards. If the climate did not kill them, the Indians would—so it amounted to the same thing. Still the prospectors kept going, and though many of them fed the crows, those who did not, found claim after claim, until finally the knowledge of the mineral wealth of the region was forced on to the people of the United States, and Arizona became what it is. It is to the prospector that the prosperity of this and other regions is due, since, without their labor, attention would never have been drawn to the natural resources of the country.

Probably there is no greater feeling of independence and freedom than that experienced by men in starting out on a trip of this kind. An absolute freedom of movement and thought, a sensation as of care left behind, a certainty that no telegram will reach you, or other outside business distract your attention; a buoyancy born of hopeful feelings and anticipation of good fortune; necessities provided in advance for a specified time at least; a confidence in your own resources, and that certainty of success which every prospector has, combine to make such moments long remembered with pleasure, as the writer remembers them in days gone by.

SUCTION FANS.—The suction fans now in use on the Comstock—one at the Bonner shaft, one at the old Consolidated Virginia and a third at the Sierra Nevada shaft—are proving very valuable aids in ventilating the lower levels. They have now been in use a sufficient length of time to allow of their value being very justly estimated. With one of these fans in operation a shaft will carry off as much foul air from the underground regions as would two shafts of the same size without the suction apparatus. Such fans are likely to come into use in other places along the lode and at mines in other camps in the State. The cost of running is small.

UPON the request of Katata, the condemned Indian murderer, Judge Deady has shortened the time of his execution at Portland, Oregon, to Tuesday, the 28th inst., instead of Friday, the 31st. The prisoner made this strange request so that his friends, who must leave by the steamer of the 29th, could witness his execution and carry back to his people his dying words.

SMELTING WORKS.—Wm. Gay was in town this morning and informed our reporter that he had about completed arrangements for erecting smelting works on a copper location at Spenceville. The parties mostly interested in the enterprise are residents of Nevada City. There will probably be a big copper boom at Spenceville as soon as the weather becomes settled.—*Grass Valley Tidings.*

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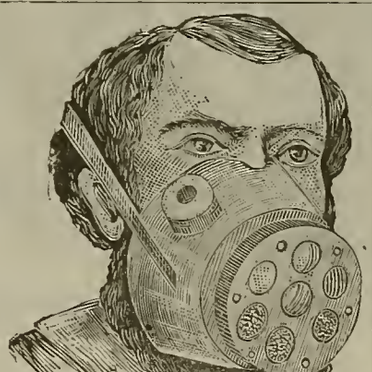

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Chemist and Assayer,

No. 110 Sutter St., S. F.

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Outfit for Prospectors.

To obtain a suitable outfit is the first duty of the prospector, and the following list of articles and suggestions may be of some value to those uninitiated in this sphere of life:

He should have two pairs of thick blankets, a buffalo-skin or, if possible, the more luxurious comfort afforded by a pneumatic rubber mattress and pillow, which are very light, pack closely (after the exhalation of air), and, by protecting the body from the emanations that arise out of the damp ground, prevents disease by increased accommodation; two strongly buckled leather straps, for securing blankets, mattresses, etc., when packed for traveling; a suit of strong gray clothes, a change of flannel underclothing, a slouch cap and a strong pair of boots; a Henry or Spencer breech-loading rifle; a full-sized Tranter's, Smith & Wesson's, or Colt's six-shooter; a leather holster with waist-belt, and a good hunter's knife; a mule or a mustang horse, accustomed to mountain life; a bridle having a short whip attached; a horned saddle fitted with rings for securing blankets, saddlebags, water canteens, etc.; one of the stirrups (I prefer the left) should be fitted with a tube for receiving and supporting the muzzle of the rifle, the upper end being suspended by a leather yoke, so riveted at its middle that one loop can be tightened on the taper rifle stock, and the other passed loosely over the saddle-horn, that it may be freed for immediate use when necessary. This same yoke can be used for "hobbling" the animal at nights, by punching two holes at a suitable distance from the ends, to allow sufficient freedom to the legs, when securely tied with buck-strings, through these holes, and then stop-knotted, so that the animal shall not stray too far away, when the scattered pasturage prohibits the use of a picket-rope. A small "poll" pick and a light and solid wrought-iron baking-dish of the shape of the prospector's pan, to be used, as required, for either purpose. An eight-inch wrought-iron frying-pan, a coffee-pot, tin cup, fork and spoon, a good supply of matches, some soap, a towel, etc; a blow-pipe, with suitable tools and fluxes for testing and assaying.

These, with a pocket compass and spy-glass, constitute a first-class prospector's outfit, and with such (excepting only the buffalo-robe, mattress and pillow), the writer has made a lone journey of 800 miles, over 14 ranges of mountains, in 30 days, cooking bread and victuals, en route, from the following provisions: Flour, 14 lbs.; bacon, 11 lbs.; tea, ½ lb.; a box of yeast powder, with pepper and salt. These, varied and assisted by two jack-rabbits shot on the way, deserted with good digestion, were more relished than better food would have been under less active and invigorating circumstances.

It would be folly to attempt a minute description of the general subtleties of sage-bush cookery, as most men will succeed therein as well as I did, and will be enabled to get on sufficiently well to prevent starvation (if not to realize the value of tasting grief, that they may learn to live more contentedly afterwards), and necessity will dictate many varying dishes, by roasting, frying and stewing.

There is, however, one suggestion that may enhance comfort, when passing through an unusually dangerous Indian country, when fires must be avoided at or near your camping-ground, and cold collations become a consequent necessity. In such circumstances, I boiled, when in security, one-fourth of a pound of tea in a quart of water, for 10 minutes, and after removing the leaves, continued the boiling of this strong tea-water until it evaporated to about a pint, which I carried for use when required; it will be found that one spoonful of this, when added to a cup of water, makes a much more palatable and refreshing beverage for washing down your frugal meal than water, and it will prevent the headache that will otherwise result. A good remedy for the headache, in still more dangerous journeys, is to chew either of the agreeable and nourishing herbs, tea or coffee, as many do the useless and disgusting weed, tobacco.

This, being under peculiar circumstances, was worse fare than such men generally enjoy, and as I was alone, and traveling over strange ground, my poor, unfortunate animal, even thus freighted, with self, supplies, etc., had to pack 250 lbs. 30 miles per day, under a scorching sun, over mountains and alkaline flats, partaking of her scanty fare of chance bunch grass, during the night, most miserably restricted by hobbles. Mules have been much extolled for this work, and they may be better on the hard mountain; but, for the general purposes of exploration, the good, hardy, enduring mustang, if free from vice, is not only faster, but much easier for the rider, and on soft ground travels freely, where the mule, sinking deeper, from insufficient area of foot, is retarded at every step; moreover, the mule's back is too ridiculously strait for the requisite stability of the saddle when traveling over undulating country, and this alone would favor the use of the horse. As to their comparative measures of amiability, neither can claim much superiority, for the old saying of "Stubborn as a mule," may be equaled by a new one, "Wicked as a mustang."

These desirable equipments are often curtailed by a deficiency of cash, and those that are imperatively necessary are selected at discretion; but, in no instance, (unless prospecting for a lunatic asylum), should he expunge more from the list than the horse or mule, with their appendages, the buffalo-hide, rubber mattress, pillow, one blanket, and the rifle; then he should, if possible, obtain the substitute of a faithful donkey, to pack his baggage and share his solitude.

Before moving yourselves away from water and grass, it will be necessary to resort to your most superior judgement for the whereabouts of the next suitable camping-ground, which I have seldom failed to anticipate from the following considerations:

In viewing a distant mountain, take particular care to measure with the eye the extent of mountain slope that is drained by any particular canyon; for, the greater the expanse of such surface of drainage, the more likely you are to find water. Granite, by absorbing less, yields more surface water than clay slate, and clay slate more than limestone. Snow-capped mountains are more to be relied on, in such positions, than those that are uncovered. Patches of willows, cottonwood, wild oats, rye, and other greens, indicate, by their extended growth beyond the mouths of canyons, the pressence of water, which may often be seen at great distances.

Water frequently runs, during the night and early morn, much farther down the flats than after the sun's meridian heat has evaporated a portion of the running stream and its upper tributaries; so that, in apparently dry rivulet bottoms, moisture if not water, may be found a few inches under the surface, showing that it has recently run thus far, and the probability that it still flows a little higher or near to the mountain gorge.

Where water runs, grass will also be almost invariably present, in sufficient quantities for transient feed. If darkness should overtake you before reaching such a canyon, your animal will find water, by superior instinctive faculties, if unrestricted by reins, much sooner than you can.

It may be occasionally necessary to ascend a mountain that is deeply covered in snow, to examine some prominent out-crop; and if you have not the regular 10 ft. long by 4 inches wide snow-clog, you can readily make a substitute, by interlacing a few willows to form a support of two ft. long by one ft. wide, with holes in a suitable midway position for securing them under the shoes or boots. These will bear you up in very soft snow, and are much more easily made, carried and used, than the others, which require considerable practice, for much advantage.

In making the last-named snow-shoe, it is better to round off the outside corners and finish to the shape of a half-moon.

In cold-weather traveling, it will also be very necessary to resort to extra artificial means for keeping the hands and feet warm, and a pair of kid or buckskin gloves or mittens, lined or covered with flannel, will be ample for the hands; while a bar ey sack, cut into rectangular halves, wrapped and tied around the boots, will be superlatively effective in preventing the feet from becoming cold and frost-bitten. If you have no cord for securing the half-sack, you may first cut the sewing of the barley sack, and then, after cutting it straight through its longest diameter to form two triangles, they may be bound around the boots, then secured under the hollow of the sole, and over the instep, by knotting the acute-angled ends of the canvas.

Being thus prepared, the important questions arise: Where to prospect? Which formations should be sought? And what should be avoided.—*Phillips' Explorers', Miners' and Metallurgists' Companion.*

Undercurrents.

A large proportion of the gold, as it exists in deposits of gravel, is disseminated through it in small particles, or what is ordinarily denominated as flour gold, and without the introduction of proper mechanical appliances to save these particles in the process of hydraulic mining, a large amount is necessarily carried away by the action of the swift currents of water through the sluices. The knowledge of this fact has led to the adoption of what are known as undercurrents, and it has been found that by their use the product of gold in nearly all of the mines worked by hydraulic force has been very largely increased.

Undercurrents are formed by building large, flat boxes, or platforms, by the side of and a little below the main sluice boxes. Their size and shape depend, to some extent, on the facilities afforded by the contour of the ground where they are to be constructed. Triangles, irregular oblongs, and parallelograms, containing a superficial mean surface of from 500 to 1,000 square ft., are the forms generally adopted. They are designed to receive from the main sluice boxes a certain portion of the finer gravel wash, black sands, quicksilver and amalgam, and to afford to the particles of gold and amalgam a better chance to settle permanently in the riffles, which are evenly disposed over the whole surface of the platform. For this purpose an opening is cut across the bottom of the main sluice boxes from 15 to 18 inches in width. In this opening are inserted steel bars 1 inch square and 1 inch apart, generally fixed in a cast-iron frame and forming a grating. The small particles of gravel, sand, gold, amalgam, etc., which pass through this grating, are caught in a box placed below the sluice boxes, set on a pitch of about 1 inch per foot, whence they are carried by the force of the water, which also falls through the grating on to the platform (or undercurrent), which is provided with check boards and riffles. This platform is laid on a grade of from 10 to 12 inches per each 12 ft. of length, and has an opening at its lower end so arranged as to return the bulk of the material received upon it to the line of the main sluice boxes below. In order to distribute the water and material received from the main sluice boxes evenly over this platform, a series of check boards are placed at its upper part, in a direct line with the box, under the grating of the main sluice, which first receives the discharged material. As the water, gravel, etc., flows out of this box, part of it strikes against the nearest check board and is turned down the platform, the remainder, flowing in, is diminished and distributed by each succeeding check board, and an even flow over the whole platform is thus obtained. At the lower end of the platform the discharge of the water, gravel, etc., into the main sluice boxes below may be arrested by the insertion of a small box, on a grade, into which the material drops from the riffles.

The undercurrents and main sluice boxes discharge their contents into a deep and strongly-framed box laid with a heavy stone pavement. From the upper part of this box a continuation of the main sluice leads the gravel stream to other undercurrents, drops, etc., and thence to a final point of discharge. The lower part of this box must be 4 or 5 ft. deeper than the point from which the main sluices are continued, and will be found to be of great service in catching fine gold, amalgam, etc.

The gratings in the main sluice boxes necessarily deprive the latter of a considerable quantity of water. To counteract this loss, the main sluice boxes are narrowed about 6 inches to contract the current of water, until both streams, that of the undercurrent and that of the main sluice boxes, reunite as before described.

Undercurrents will be found to be of important service in catching rusty gold, which cannot be touched by quicksilver, and which, lessened in specific gravity by the finer matter enveloping it, is very liable to be carried entirely through a long line of sluice boxes to the final discharge, and consequently lost. The gentler flow and shallower space, and larger distribution over the platform of the undercurrent, gives to this rusty, as well as to the fine or flour gold, greater chances to be caught by the more extensive riffle surface.

Riffles are generally made of wood; sometimes of wood covered with strap iron; but in all cases where there is a limited or very little fall, a great advantage will be gained in using riffles made only of iron, as the smooth surface reduces the resistance to a minimum, while the spaces for catching the valuable metals can be largely increased.

For undercurrents the following form of construction is suggested: Let the iron bars be 1¼ inches wide, 1 inch thick and from 12 to 14 ft. long, fitted into cast-iron cross supports, which serve to hold them in place and allow spaces of three-fourths of an inch between each. These cross supports are slotted so as to hold the longitudinal bars firmly, and are made about 2½ ft. long. This form of riffles will be found advantageous in cleaning up, as they can be easily handled, and their wear can be made even by turning them over, and end for end alternately, in each succeeding run. The cost of riffles for an undercurrent 10 ft. wide and 48 ft. long will be less than $500 in San Francisco, and it is believed that, by their use in the form suggested, a large saving of gold can be effected.

How to Work Flat Claims.

Some time since a description appeared in the Oroville (Butte Co.) *Mercury*, describing the claims of the Oroville Mining and Irrigating Co. Mr. O. P. Powers, one of the principal owners and manager, put into the claim an arrangement for raising gravel, which was described in the journal referred to. We quote this description here, as the method of working the claim adopted may be useful in other localities where the ground is of similar character:

A few hundred yards below where Mr. Powers has worked for several years past, is a flat piece of ground that in summer is but little above the level of the river, and in winter, when the river is high, is entirely covered with water. The bluff near by is soon to worked, which will cover the flat above referred to with tailings and other debris. But how to work the flat was the question. There was no fall, and of course no place to dump the tailings. He has been for the last month working in this way: He has made a flume and laid it on top of the ground, commencing at the river and running back, say 400 ft. The last piece of the flume is 48 ft. long, and connected with the next box in such a way as will admit of its being raised or lowered, and stands at an angle of about 45°. A head of water of 100 inches, with 200 ft. pressure was being used. The nozzle of the pipe entered the head of the flume about one ft. The head of the box was otherwise closed tightly and covered on top about one ft. The balance was open, the same as any other flume-box. Where this piece of the incline flume connected with the next box was covered on the top to prevent water, gravel and stones from going over; they would thump up against the top, fall down and be carried off.

This is the whole process: Shovel the earth into this open flume, set up at an angle of 45°; turn on the water and it will go up the flume like a shot out of a gun, bump up against the top after going through the first joint of the flume, fall into the second box to be carried off the same as in any other flume. While watching the four men employed shoveling the earth into the flume, Mr. Powers tumbled a 60 or 70-lb. rock in, which was carried up the incline with ease into the flume beyond. They have been at work only one month, and burrowed a large hole in the earth, into which Mr. Powers has placed a chief and turned on the water, loosening the gravel by the car-load, which flows into this slanting flume and is driven up into the level box. As they are near the river and below its surface, from 75 to 100 inches seepage water is constantly coming into the works, but does no damage; it soon runs into the slanting box, and it, too, is driven up the 48 feet of incline into the almost level flume beyond.

We desire to state here that this slanting flume-box, 48 ft. long, is lined on the bottom and sides, inside, with wooden blocks, the same as those usually found at the bottom of flumes, so that the space inside of this flume was one foot wide by something over two feet in depth. It is a simple contrivance for mining level ground, where a head of water for driving purposes can be obtained. Any man who ever made a flume-box can make one, and that, too, at a cost of less than $100, including the blocks to line it. It is one of the simplest things on earth, and ought to have been found out years ago. It has been in operation over a month, and been examined by mine owners in this and adjoining counties, who pronounce it a complete success. No part of it wears out faster than the ordinary flume, except at the upper end, where the rock and gravel bump against the covering, which wears out very fast. Should timber be used for covering instead of boards, it would last a longer time.

Small Batteries.

Probably there is no one thing more needed by the mining community than a cheap quartz crushing appliance. That is, one that costs little to build, little to transport and little to run. Dozens and dozens of things have been tried over and over again; but we have always had to come back to the old-fashioned stamps again, which, notwithstanding all efforts to displace them, still maintain their supremacy. A stamp battery, however, does not by any means fulfill all requirements; for, while it does its work well, it is originally expensive, and weighs so much as to cost considerable to transport. It is not expensive, when the work it accomplishes is considered; but having to pay out so much money at once for it in the beginning is objectionable.

In some places in this State gold is crushed out of rock by a hand mortar; in other places, by spring pole and mortar; in other places, by arastras. In some localities mills with light stamps are used, when the character of ore admits of it. Up in Granite Basin, Plumas county, in this State, in addition to the large mills with 850-pound stamps, there are two smaller ones with light stamps. One of these has 9 stamps, 5 of which weigh 300 pounds each, and 4 of 200 pounds each. One mill has 4 stamps of 400 pounds each.

Mr. D. Van Lennep, of the locality mentioned, gives to the Director of the Mint his experience with these small batteries, which will interest many of our readers. He says:

Having had an opportunity to try the capacity and effectiveness of the small batteries used in this place, I will more particularly bring them to your notice. Of the two batteries used to crush the rock of the mine, one consists of 4 stamps, weighing each 200 pounds, the other of 5 stamps, weighing each 300 pounds. The stamps are given a fall of about 4½ inches, and made to fall 110 to 120 times in one minute. The cams are single instead of double, as in the common California battery. The rock of the mine is about three-fourths of medium hard quartz (that is, neither very brittle nor tough), and one-fourth small pieces of quartz and earthy material. Trials under my eyes have showed that the 200-pound stamps crush about one ton to the stamp in 24 hours, and the larger of 300 pounds stamps crushes about one and a half tons to the stamp in 24 hours. This result is exceedingly satisfactory, considering the easy transportation of the light machinery and the easy handling—two great advantages in mountainous regions. The light batteries do not need the skilled labor of millwrights to be put up. The estimate of cost is reduced to more than half of a heavy battery. The gold is extracted in the same way as in large batteries—that is to say, that the free gold is amalgamated in the battery with quicksilver, and by running the pulp on copper plates having a coat of quicksilver or silver amalgam. Rude contrivances, to concentrate sulphurets and catch hard amalgam run off the plate, consist of coarse sacks laid across the tailings sluice. These sacks are taken out every day or every 12 hours and washed in tanks. The ledges are mostly in the hands of the discoverers or of persons of small means, and are worked in a small way, giving handsome returns if handled with knowledge. The ledges are small, from 6 inches to 3 and 4 ft. wide. Free gold is about from $3 to $12 a ton in the rock. The sulphurets are rich, but no attempt has yet been made to work them. The bedrock is a soft granite, and cost of extraction small; wood is in great abundance.

H. M. Newhall, a California pioneer who died last week in San Francisco, left $2,500,000. The deceased possessed real estate in this city, San Mateo, Santa Clara, Monterey, San Luis Obispo, Los Angeles and Ventura counties. He also held stock in various corporations and railroad and municipal bonds.

The California Iron and Steel Company.

The California Iron and Steel Company, whose furnace and worke at Hotaling, Placer county, we illustrated last week, was incorporated for the purpose of utilizing the iron deposits of thie coast, and to keep the money at home now annually sent to foreign countries to purchase pig iron, har iron, plate iron, cut nails, and steel ingots. All of these branches it is the intention of thie company to eetablish upon this coast. The Directore are: Egbert Judson (President), George W. Gibbe (Vice-President), B. B. Redding, A. P. Hotaling and Irving M. Scott. To show the scope of operations proposed hy the company (the office of which is in San Francisco), and its present status as well, we publish its prospectus in full, as follows:

As a sure supply of the raw materials ie the basie of a permanent and enccessful business of this natnre, the company have purchased from the California Iron Company their extensive heds of iron ore, together with its furnace, charcoal kilns, wood lende, roads, ditches, etc., in accordance with the following schedule:

Land (timber), 7,800 acres, @ $5	$39,000.00
Roads (coal and iron), 31 miles	7,147.15
Buildings at furnace	8,783.67
Kilns (20 patent kilns, capacity 45 cords each)	30,869.63
Blast furnace	82,536.46
Bridges across Bear river, etc	2,700.00
Ditches and reservoirs	7,120.26
Rights of way for roads, ditches and railroad	3,755.00
Dwellings, offices, stores, stables, etc	7,531.86
Attorney's fees	3,500.00
Opening limestone ledge	950.00
Engines, blowing cylinders, boilers and fixtures	26,570.00
Hoisting engine, reels, boiler feed-pump	2,000.00
Vertical engine, with shafting, pulleys and fixture	2,137.00
Rock-breakers, shafting, elevators, etc	2,800.00
Ore on dump and at furnace, 4,700 tons @ $2.40	11,280.00
Pig iron (1,640 tons @ $20)	32,800 00
Cordwood (11,850 cords @ $2.50)	29,625.00
Coal (81,000 bushels @ 7c)	5,670.00
Horses, harness, buggy, carts, wagon	2,000.00
Mining tools and other tools (as schedule)	1,637.00
Blacksmith shop and fixtures	370.00
Book accounts	19,225.56
Cash in bank	4,176 87
Interest on $300,000 1½ years @ 6%	27,000.00
MINES.	
To purchase and development of Furnace mine, shaft No. 1; Limestone mine, shaft No. 2; Brown mine, shaft No. 3; Gray Iron mine, shaft No. 4; Paint Hill mines, shafts Nos. 5, 6 and 7, and Scott mines	53,430.00
Making a grand total of	$414,615.45

For a property improved and fully demonstrated. These bede of ore have heen long known to exist, and Senator Highy took a large qnantity of these ores East, in 1862 and 1863, and had pig iron, wronght iron and eteel made from it, all of which were of a high grade. State Senator Highy, of Calaveras, and Representative Neff, of Placer, introduced a hill for a State bounty, to he given to the first production of pig iron in California, 1864. The ores are principally limonite, rsd hematite and magnetic. The followiug analyses were mede hy Prof. Henry G. Hanks, State Mineralogist, and are taken from his report of 1880:

Limonite.—Clipper Gap, Placer county, contains 53.88% of iron.

Limonite.—Clipper Gap, Placer connty, contaius 56.58% of iron.

Ocherous Limonite.—Clipper Gap, Placer county, contains 55.93% of iron.

Magnetite.—Section 15, township 13 north, range 8 east M. D. M., Placer county, California.

ANALYSIS.

This ore contains 60.29% of iron.	
Silicia	3.23
Sesquioxide of iron	80.05
Protoxide of iron	17.06
	100.34

White Marble—Used as a Flux.—Section 15, township 13 north, range 8 east M. D. M., Placer county, California.

ANALYSIS.

Silicia	.15
Sesquioxide of iron	.35
Lime	55.72
Carbonic acid	43 78
	100.00

In making 4,429 tons of iron, the ore averaged 63% of iron.

During Novemher, 1881, in eeven samples from the bottom of all the deposits, the resulte from quantitive analysis were as follows:

No. 1 of Iron	62 1
" 2 "	63.5
" 3 "	63.1
" 4 "	65 2
" 5 "	60.3
" 6 "	62.6
" 7 "	64.17

These were from average eamples, and ehow that after yielding over 7,000 tone, the vein at 90 ft. deep contains the eame per cent. as at the surface.

Nothing practical wae done in the making of iron until the organization of the California Iron Co., in 1880, when active operations were commenced and puehed to a succeesful completion. The stack was put in blast April 17th, and firet iron made April 24th, 1881. The furnace produced 4,429 tons of firet-class iron of fine gradee—No. 1 heing soft and tough, No. 2 close and etrong—hoth excellent foundry gradee, mixing well with the hrande usually found in this market, and eepecially Oswego iron from Oregon. Noe. 3 and 4 are well adapted for and make good car wheele, chilling readily and evenly. It is now ueed for that purpoee by the Central Paoific Railroad Company, at Sacramento; Occidental Foundry, Arohitectual Iron Worke, and Golden State and Miner's Foundries of San Francisco, and hy David Leeter & Co., New Tacoma, Washington Territory, for Northern Pacific Reilroad. No. 5 is white iron, and used extensively for shoee and dies. Test pieces of casting, made from mixing Nos. 1, 2 and 3, gave, in a Fairbank's testing machine, respectively: 31,000, 31,000, 31,360 and 30,640 pounde to the square inch, tensile strain. While from soft pig of No. 1, hy the same machine, the results were, respectively: 17,857, 18,629, 18,387 and 18,300 ponnde per equare inch of tensile strain, the fractnre in each case showing a strong, fibrous qnality. These practical tests, and the use of several thousands of tone in the varions foundries, demonstrate the value and importance of this plant and miue. The quantity and quality of ore, flux and fuel have been fully demonstrated. The objects of the California Iron and Steel Company are:

First—To build a spur-track, 4' 8½" gauge, from the furnece to the Central Pacific Railroad, at or neer Clipper Gap. Distance, ahout four miles; cost, about $15,000. The iron will be furnished by the railroad company.

Second—Build a strap iron tramway, 30" gange, from furnace to kilns Nos. 1, 2 and 3, about eight miles; cost, about $6,000.

Third—To manufacture acetate of lime or pyrolignite of lime, turpentine, rosin, creposote, parreffine and wood spirits, or methylic alcohol, from the distilled vapors produced from the wood used in making charcoal, the sale of which products, in other places, not only pays the cost of making a better qnality of charcoal hy 25%, hut yields a profit of $3 per cord of wood used.

In the ahsence of factories producing these articles on this coast, a market is already provided for them; and should the California Iron and Steel company put into operation this plan, it will make a saving in the prodnction of Iron alone of $8 per ton, to say nothing of the *product* of the kilns.

Fourth—To purchase 25,000 acres of heavy timher for the manufacture of patent charcoal and the chemicals, as above described.

Fifth—To erect and maintain on a suitable location at or near San Francisco, a rolling mill, for the making of har iron and plate iron, to be constructed to roll nail plates for cut nail work, size and design of same to he hereafter determined hy the stockholders, the demand for which may be briefly etated to exist by the importation annually of hundreds of thousands of tons of har and sheet iron.

Sixth—To erect and maintain a cut nail mill to meet the requirements of this coast, where 246,400 kegs are annually imported, and not a single pound manufactured here.

Seventh—To erect and maintain a steel works for the manufacture of steel ingots and steel castings, to be nsed in the various hranches of industry.

Eighth—To erect and maintain smeltiog furnacee capahle of producing the raw materials, from which to manufacture the several articles above described, and to purchase iron ores, etc.

To carry out the above plan, the California Iron and Steel company have incorporated with a capital etock of $2,675,000, divided into 26,750 ehares, the par value of which is $100 each. Of these shares 15,990 are enhscribed for hy the former owners of the California Iron company, and 10,760 are offsred to the people of San Francisco, the stock to be delivered upon the payment of 25% of par value, which we hope will hs sufficient, without call for further assssments. The money obtained from the sale of which is to be applied to improvement of the facilities of furnace plant, and the purchase of a suitable site, and the erecting of the first section of the rolling mill. The other hranches will he added as fast as the stockholders and trustees shall determine.

Nickel and Cobalt.

[Written for the PRESS by C. H. AARON.]

How many of our miners, prospectors and assayers are on the lookont for these valuahle metals? Prof. Sterry Hunt says they frequently accompany cnpriferous pyrites and oxides of nickel, copper and cobalt have been found in considerahle quantities in Missonri. He also mentions their occurrence in a sample of ore from Western Nevada which carried 9% of copper. Hunt points out that the oxides of nickel and cohalt are converted into chlorides hy the action of a hot solution of copper chloride. Such an ore as that mentioned could be treated with such a qnantity of solution of hluestone and salt as wonld suffice to dissolve out the nickel and cohalt; the excess of copper in the solution removed hy digesting with a fresh lot of ore, or with several fresh lots, dieeolving nickel and cohalt from eech until all copper was removed by eubstitntion. In this way strong solutione might he got, free from copper, iron or lead. Antimony conld be easily removed, if preeent, and the oxidee or eulphidee of nickel obtained hy well-known methode. Each lot of ore, when freed from nickel and cohalt, could then he treated hy either of the two Hunt and Douglase processee for the copper; gold and eilver, if the ore contained any, heing aleo eaved. Prof. Blake reporte the finding of cohalt hloom in San Bernardino county. The writer hae aesayed a eample of *anabergite* from Esmeralda county, which contained 12 per cent. of nickel, and was informed that much better ore had been found there, though only in small quantities.

The fact that any euch oree have heen fonnd indicates a prohahility that valuahle minee may he discovered as the reward of intelligent eearch.

Our minere are not generally familiar with the ores of nickel and cobalt, and have directed their attantion too exclusively to gold, eilver and copper. In this matter, however, a certain progression is observahle. From 1849 to '59 the eearch was almost entirely confined to gold, in so far as the Western States and Territories were concerned. The discovery of the silver oree of the Comstock gave a new direction to prospecting, and from that time to the present silver has received at least an equal share of attention with the more valuahle metal. Quicksilver hae also heen actively sought and found. The present prominence of lead among the productions of the regions referred to, is due less to its intrinsic value than to its connection with the extraction of silver from the same or other ores. The production of copper in the United States, estimated at about sixty millions of pounde, has of late received important accessions from Arizona. A considerable quantity is obtained in California, and immense deposits of ore are said to await development in New Mexico. The euccess of iron smelting at Clipper Gap has set many hands and heads at work on schemee for similar enterprises at other points. Tin, though often sought and known to exist in considerahle quentity at Temescal, in the southern part of California, has not heen found, to any great extent at least, in other sections, nor profitably mined in that. Manganese is mined to a limited extent for home consumption. Chromium has of late years assumed a quite important plece among our products. Antimony has been successfully worked on a large scale, though operatione at Berkeley have heen euspended on eccount of the failure of a supply of ore from Arizona. Of nickel and cobalt we hear almost nothing.

Not only are miners unacquainted with the appearance of the ores of these metals, but a very large proportion of the very large crop of aseayers produced here within the last 15 years are equally uninformed on this point, and too many of them are not even competent to make nse of any method of detecting nickel or cohalt in an ore, not to spsak of making a quantitative assay, which indeed is not very easy to do correctly. Add to this that a considerable quantity of nickel or cohalt may exist in an ore, in conjunction with other and better known metals, without presenting any prominent characterietics to attract the attention; that they do not occur with great frequency; that many of the minerals containing them greatly resemhle, to the untrained eye at least, other less valuable snhstances; and finally, that assayers, as a rule, are not in the habit of doing any more work than they are paid for, and it ssems probable that not a few samples of nickeliferous and cobaltiferous ores may have heen found, and even assayed or worked for other metals, while these have escaped notice.

Although an accnrate assay of nickel and cobelt, hy the wet methods, ie not easy, nor in many oases possible, with the re-agents and apparatus at the command of the country assayer, yet a very good approximation may be obtained by a fire assay, either hy the hlowpipe or on a larger scale in the mufils, through the agency of arsenic, which often exists in the ores, or may he added if not naturally present. The mere testing for these metals is not difficnlt and every asseyer onght to be able at least to detect them if not to arrive at a reesonable approximation to their quantity. They frequently occur in conjunction with silver, copper, lead or hismuth, also with manganese.

Cohalt, fused in horax, on platinum wire, or on charcoal before the point of the hlue flame from the hlowpipe, gives a head which is small blue, whether hot or cold, and which cannot be decolored in the yellow flame, Nickel treated in the same way, bnt best on wire, gives a reddish-hrown head, lighter colored when cold than while hot, which hecomes first gray or black, and then colorlese if heated on charcoal in a yellow flame. These effects are sufficiently characteristic, bnt difficulties arise from the presence of other metals, which also afford colored heads with horax. Thus the presence of much iron on a little chromium may prevent the detection of cobalt in this way, and a large quantity of copper makes it difficnlt or impossible to determine nickel, while if all occur together, and other metals besides, the case is a bad one for any simple method. Of the two, cohalt is the more easily detected in mixed ores, and a method will he given hy which hoth may be readily found in en ore contsiuing all the more common metals.

A good test for nickel in a neutral or elightly acid eolution ie potassium or eodium zenthate or zanthogenate, which givee a yellow precipitate, eoluble in ammonia and reproduced by acetic acid. Thee reagents are extremrly eeneitive; with copper they give a precipitate which is aleo yellow, which cnrdlee hy ehaking, and ie distinguished from that of nickel hy being insoluble in ammonia. With a minute trace of cobalt, a dirty green precipitate ie prodnced, which is not dissolved hy ammonia. These reactione afford a ready meane of detecting nickel in presence of copper and cohalt in an ammoniacal solution, hy adding a drop or two of either of the zanthatee mentioned, filtering and adding acetic acid to the filtrate, when nickel, if present, will give the yellow precipitate.

The reagents are made hy adding bieulphide of carbon to an alcoholic eolution of caustic soda or potassa. Any excese of the hieulphide of carhon subsidee to the hottom, and the compound can be poured off and largely diluted with water for use; or, the whole may he allowed to dry hy evaporation, and the eolid reeidue dieeolved in a large quantity of water. Sometimes reddish, acicular crystale are formed, but the writer has not ascertained the conditions of their production, and it is not essential.

If to a solution of cobalt, in tartaric or citric acid, excess of ammonia be added, and then solution of red prussiate of potash, a dark red color is produced (Skey). A drop of cobalt solution added to a concentrated solntion of sodium sulphoizanide produces a hlue mass. Neither nickel, iron, manganese nor zinc interferes if the solution ie neutral (Schonn).

The solutions of nickel in acids are of a pale green color, which excess of ammonia changes to hlue. The similar solutions of cobalt are mostly pink, which ammonia cheugee to green, and, by exposure to air, to brown. The pink of cobalt ie complimentary to the green of nickel, and if the two metals are present in suitahle proportion, the solution is colorlese. Canstic potessa precipitates the hydrated oxides, which are soluble in ammonia, and in ammonium carhonate; also, to some extent, in sodium carbonate. Hydrogen sulphide does not precipitate these metals from solutione of the mineral acid salts, but doee from the acetates. These two facts afford the means of separating copper, silver, lead, hismuth, etc., on the one hand, and manganese on the other.

The ores of nickel vary greatly in appearance, being colored copper red, steel gray, white, brass yellow, dark green and apple green. Those of cobalt may be steel gray, tin white, crimson, peach-colored or lavender blue. Nickel is extensively used for making the alloy known as German silver, and for electroplating.

The chief use of cohalt is in the manufacture of pigments, and for coloring glass and pottery. It is therefore not reduced to the metallic state, but ie valued and sold as oxide.

Rock Temperatures.

At the last meeting of the California Academy of Sciences a communication was read from Chas. Forman, superintendent of the Forman shaft, on the Comstock lode, Virginia, Nevada, giving the temperaturee of the rock in the Forman shaft.

They are taken from the surface to the depth of 2,300 ft., as ascertained by drilling holes not lsss than 3 ft. deep into the rock, and inserting into the hole a Negretti & Zambra slow-acting thermometer, of the pattern adopted hy the Underground Temperature Committee of the British Association, and standardized at Kew. These holes were closed with clay, and the thermometers were left in for 12 hours, not less than three holes being tried at each point. The following are the depths in feet, and temperatures in degrees Fahrenheit:

Feet.	Deg.
100	50½
200	55
300	62
400	60
500	68
600	71½
700	74½
800	76½
900	78
1000	81½
1100	84
1200	89½
1300	91½
1400	96½
1500	101
1600	103
1700	104½
1800	105½
1900	109
2000	111
2100	119½
2200	116
2300	121

Old Timers.

The "old timer" is seemingly one of the fixtnres of the western mountains. No matter where you go he is there before you. He loves solitude, a dingy, smoky cahin, a white-eyed "cayuse," a yellow, mangy dog and a good gun. He has an unlimited supply of primitive ideas on the leading qnestions of the day, argument being his principal failing. We all know him, or, if we don't, can soon get acqnainted.

Although eccsntric in his habits and mode of living, he has a large heart—the "latch-string" of his cahin alwaye heing ont, his private pride consisting in befriending somo "poor devil" who is "ont of luck." When "old timers" meet, it's "hallo!" when they part, it's "eo-a-long!"

To the "old timer" whisky, bacon and coffee are the only staple articles—"terbaker" a necessity. He has a mortal hatred of the "tenderfoot;" women, in his mind, being a necessary evil, but, nevertheleee, an ahomination. I mnst remerk, in justice to the "old timer," that when he doee get "gone" on one of the fair eex there ie no "fooliehness" in his lovemaking—"pistole and coffee for two" often eettling little outhurete of jealouey, the "old timer" generally "getting away with the baggage."

He ie quite garrulone on the events of '49 and '50, and to dispute any of his assertione, although far etretched and improbable yarne, would cauee a light on the instant. The name of "injune" provokes him into ewearing in the choicest Eoglish, and when he is "red hot" on the subject, Spanieh oaths and invectivee mingle with the mother "lingo" with a eurprising fluency—hence the origin of the phrase, "he ewears hy note." Put a "biled ehirt," a "etandnp" collar and a euit of "etore clothee" on an "old timer," compelling him to wear them one day, and I'll warrant that he will cut his throat before night, if he isn't watched.

Any one failing to recognize the "old timer" of whom I epeak in this sketch had hetter take the advice of Uncle Horace—"Go West and grow up with the country."—*Idaho Messenger.*

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TESTIMONIALS.

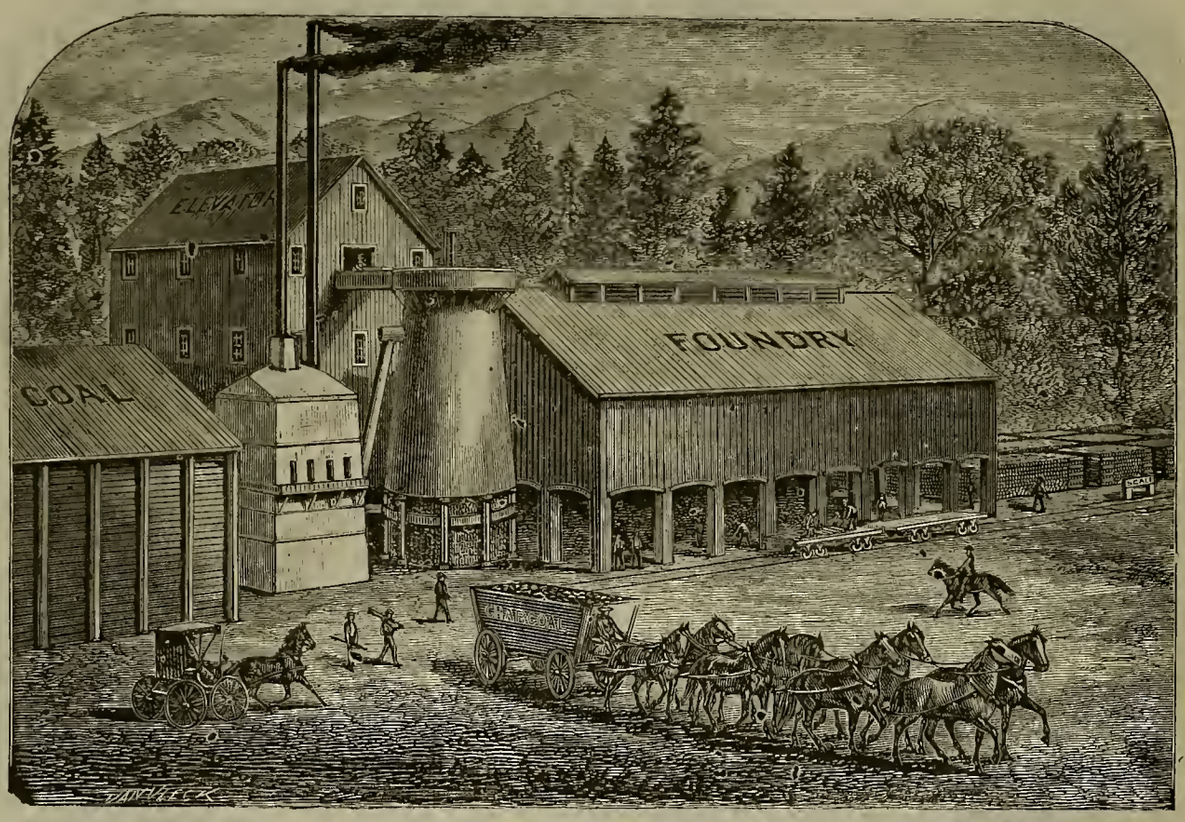
OFFICE INDUSTRIAL IRON WORKS,
San Francisco, March 7, 1882.
California Iron and Steel Company: Gents—We have used Nos. 1 and 2 of the California Iron Company's iron, and find same first-class in every respect, especially for castings that require great strength.
McCORMICK, LEWIS & Co.

OFFICE GOLDEN STATE AND MINERS' IRON WORKS, San Francisco, March 8, 1882.
California Iron and Steel Co.: We have been using your Clipper Gap pig iron quite freely for some months, and find it an excellent iron for miscellaneous machine work. In itself close-grained and tough, when mixed with Scotch iron it makes the casting of even texture, easily worked, yet strong.
We judge it to be a first-class American iron. Some experiments of ours show it to be remarkable for its chilling qualities, suggesting its value for car-wheels. Truly yours,
GOLDEN STATE AND MINERS' IRON WORKS.
By Walt L. Palmer, President.

Office ÆTNA IRON WORKS, S. F., M'ch 7, '82.
California Iron and Steel Co.: Gents—We have used a large quantity of the California Iron and Steel Company's Clipper Gap iron. We consider it a first-class iron, and for strength equal to any in this market.
PENDERGAST, SMITH & Co.

Office OCCIDENTAL FOUNDRY,
San Francisco, March 8, 1882
California Iron and Steel Co.: Gents—We have used about 200 tons of the California Iron and Steel Company's Clipper Gap iron, and for general foundry purposes find it an excellent iron, equal, if not superior, to any in this market. Yours respectfully,
STEIGER & KERR.

Office MECHANICS' FOUNDRY,
San Francisco, March 7, 1882.
California Iron and Steel Co.: Gentlemen—We take pleasure in stating, that having used considerable of your iron, we find the soft variety (to which we confined our wants), to be of excellent strength and texture, replacing advantageously similar brands of Eastern and foreign irons.
We are especially gratified in being able to state this, and congratulate you on your success, as we feel assured from the well-known conservative character of the individual owners of your company, that, with the largely increased production, for which you are preparing for the near future, you will be able to establish a uniform grade of prices, at such reasonable figures as will enable the iron founders of this city to compete successfully for much work that is now being driven from this city owing to the great and very irregular fluctuations in the price of imported irons.
Respectfully yours,
MECHANICS' FOUNDRY.



Office PACIFIC IRON WORKS, S. F., March 3, 1882.
California Iron and Steel Co.: Cents—We have used several hundred tons of your Clipper Gap iron during the past four months, and regard it as of excellent quality. It is finer in texture and stronger than any brand of English iron that comes to this market, and fully up to the average of our best American iron. Yours truly,
RANKIN, BRAYTON & Co.

Office CITY IRON WORKS, S. F., March 8, 1882.
California Iron and Steel Co.: Cents—We have used a large quantity of the California Iron Co. (Clipper Gap), and find it a very superior iron, strong and tough, and for general foundry purposes equal if not superior to any foreign iron, or iron made on this coast, in this market. The cast-iron work on the building erected for A. B. McCreery, Esq., on the corner of Pine and Davis streets, San Francisco, is made from your iron, and are the first castings ever made from California iron for that purpose.
Yours, etc., CITY IRON WORKS.

Office UNION IRON WORKS, S. F., March 8, 1882.
California Iron and Steel Co.: We have used two thousand tons of the various grades of your iron, and found it equal to the best American charcoal iron, and far superior to any foreign brands. It is tough, clean and soft—just the iron for machine purposes. PRESCOTT, SCOTT & Co.

Office NATIONAL IRON WORKS, S. F., March 8, 1882.
California Iron and Steel Co.: Gentlemen—We have used Nos. 1 and 2 iron of your make, Clipper Cap, and have found it a very strong iron, giving us entire satisfaction.
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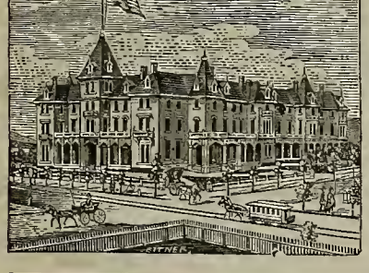

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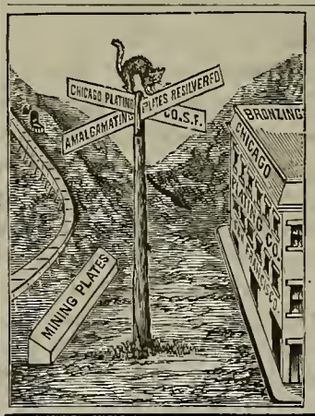

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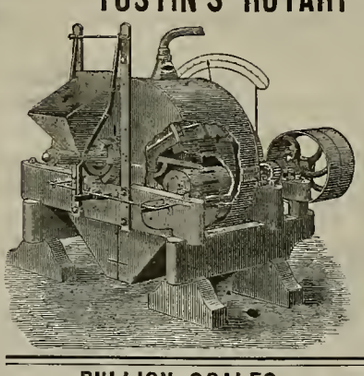

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Of the Forms of Minerals—Imitative Forms.

The researches of Graham and others have shown that inorganic matter may exist in two perfectly distinct conditions, known respectively as crystalloid and colloid. The same portion of matter may be at one time crystalloid and another colloid, the difference being one of condition not of composition. Thus rock-crystal consists of crystalloid silica, but if a fragment be powdered, fused with carbonate of soda, dissolved in water, and precipitated by hydrochloric acid, the precipitated silica will now be in the colloid state. When in solution, crystalloids differ from colloids in some very important particulars, and on passing into the solid form the differences are still more evident.

Colloid minerals are few in number. They are totally devoid of cleavage or distinct internal structure, but they usually break with a very perfect conchoidal fracture. They occasionally, but not often, occur in what are called imitative forms, but are usually amorphous or without definite external forms. As examples of true colloid minerals, we may mention opal and obsidian.

Crystalloid minerals are very numerous, they include, indeed, the great majority of mineral species. They may be either crystallized, crystalline, or crypto-crystalline.

Crystallized minerals are those which occur in definite geometrical forms. Ordinary rock-crystal is a perfect example of crystallized mineral.

Crystalline minerals are such as have the peculiar internal structure observed in those which are crystallized. They consist, indeed, of a multitude of crystals confusedly crowded together, so that the external geometrical form is lost or disguised. The cavities or "vughs" of such aggregates, however, often display distinct crystals. The kind of quartz known as cross-course spar affords a good example of a crystallized mineral.

Crypto-crystalline minerals are those in which the crystalline structure is so minute that it is not ordinarily observable, but it may be detected in suitably prepared specimens when examined under the microscope. Chalcedony and agate are good examples of crypto-crystalline minerals.

Many crystalline and crypto-crystalline, and some amorphous minerals, occur in what are known as imitative forms. The chief of these are the following:

Globular. This form is often seen in wavellite, prehnite, and other minerals. On breaking a globular mineral, it is almost always seen to be composed of a multitude of indistinct crystals radiating from the center, and sometimes the outside of the sphere is roughened by the projecting points of these crystals. Occasionally the true crystal form of these terminations may be observed, but usually they are indistinct.

Reniform (kidney-shaped). This form is not unfrequently met with in nodules of iron pyrites, or other minerals which occur imbedded in clay or mud. Some kinds of red and brown hematite are called kidney iron from their occurrence in this form.

Botryoidal (grape-like). This form is often seen in that kind of chalcopyrite known as blistered copper ore.

Mammillary. This form is often seen in malachite and blistered copper ore.

Coralloidal. This structure is observable in chalcedony and aragonite, especially in specimens from Styria. It sometimes occurs in connection with earthy deposits of iron ore, when it is called flos-ferri, or the flower of iron.

Cone in cone. This structure is often met with in iron ores from the coal measures. It consists of a series of fibrous concentric conical masses, the points of the cones meeting together, or sometimes interlaced.

Stalactitic (icicle-shaped). Chalcedony, calcite, and barytes often occur in this form. Sometimes the stalactites are hollow, sometimes solid; but in stalactites of calcite and barytes, a cross-section almost always reveals a structure consisting of fibres radiating from the center, and the same thing is visible in properly prepared slices of chalcedony, when examined under the microscope.

It is probable that most, if not all, of the above-described imitative forms are the result of deposition from solution, at any rate this is known to be the case in some instances. Thus, stalactites of calcite, or carbonate of lime, may be seen in process of formation in caverns in most limestone districts, and they are very frequently formed under bridges or tunnels which have been built with lime mortar. The process of formation is as follows: Rain water containing carbonic acid in solution in filtering through limestone, mortar, or other material containing carbonate of lime dissolves a part of it. On becoming again exposed to the air drop by drop, part of the carbonic acid is given off, part of the water evaporates, and part of the carbonate of lime is deposited. A stalactite once formed, the water naturally descends to its lower end before falling off, and it is there that the greatest amount of carbonate of lime will be deposited, and in this direction its growth will be most rapid, although a small quantity of solid matter will continue to be deposited on the sides of the stalactite, so producing the concentric structure shown in the vertical section of a stalactite, or in the cross-section. The radial structure appears to be of later origin; it is really due to an incipient crystallization set up within the mass.

The water dropping from the stalactite will still contain some carbonate of lime in solution. This will be deposited on the ground beneath, when the conditions are favorable, forming what is known as stalagmite. A cross-section of stalagmite, however, will differ from that of a stalactite, owing to the tendency which the drops of water have to spread themselves out. If the supply of water be abundant, a sheet of stalagmite will be formed if only a little falls, a pillar of stalagmite will gradually rise towards the stalactite above; but in all cases the separate layers will be of about equal thickness throughout.

The crystalline structure sometimes observable in the imitative forms already described, is probably the result of a secondary action of the crystallizing forces, following the actual formation of the solid mineral. There are, however, other imitative forms which are merely irregular crystals or crystalline aggregates, and in the formation of which the crystallizing forces appear to have been concerned from the first. These are the so-called capillary and wiry forms observable in native silver, the mossy and leafy forms seen in native copper, the dendritic markings of oxide of manganese, the reticulate groupings characteristic of mountain leather, and the stellate groups of crystals often met with in stilbite and other minerals.

Mining Explosions and Mining Warnings.

The meteorologist who is at the trouble of giving warnings in the daily and other papers showing atmospherical changes that may affect mining operations, calls our attention to the result of last year's explosions, and we certainly agree with him that the small loss of life last year is matter for congratulation, considering the number of persons who were convicted of offensee, some of which were calculated to lead to serious consequences. The warnings appeared to be based on the action of the barometer. High barometric pressure, we are told, accompanied 22 of the occurrences, and low pressure 15. This, to some extent, would go to prove what we have often pointed out, that the barometer was not a reliable instrument as regards sudden changes of the atmosphere likely to influence gases in mines; that is, to indicate them before they really take place, and not coincident with them. Of the three heaviest explosions last year those at Whitfield and Lilydale took place at the time of highest barometer, and that at the Abram colliery with a low barometer. As to atmospheric pressure in connection with the explosions of last year, they go to support the theory that the most dangerous time is when the barometer is high. And we are told by Mr. Thompson, of Manchester, as the result of an extended period of observation as to explosions, that "the gas in the pits spoke out loud and clear long before any change could be discerned in the mercurial barometer." A careful collation of these atmospherical changes is by no means satisfactory as to their probable cause. The Government Inspector for Derbyshire, Mr. Evans, gives 16 non-fatal explosions in his district in 1880; and with respect to them he says: "It is curious to note that eight of them occurred whilst the barometer was rising, four whilst it was steady, and four when it was falling." Mr. Dobson, a high authority, considers that an altogether erroneous value was attached to a low barometer, for the explosion might be deferred until the storm had entirely passed away, and the mercury had regained the light and stability peculiar to settled weather. On the other hand, we have the views of Messrs. Scott and Galloway, from observations made extending over a period of four years, and they found that during that time 54% of the explosions occurred from a fall of barometer, 1% from a rise of thermometer and 27% from causes associated with atmospherical influence. The barometer has been looked upon as an instrument for indicating the changing conditions of the atmosphere, and indicating approaching liability to explosions in coal mines. But many of our ablest mining engineers do not consider it to be reliable, for changes take place before they are recorded. One of these gentlemen informs us that it has been found that in whatever degree the mercurial column may move, before that movement is perceptible the gas will have made its movement to the equivalent of such movement, and that instead of being an indicator of what is taking place in a mine as regards the exudation of gas, the barometer was only an indicator of what had taken place before its movements are perceptible.

But pressure is, of course, the great element for consideration. Gas exists in coal under considerable pressure, and no sooner is the mineral cut into than it liberates a considerable quantity of the gas, whether the barometer is high or low; but if there could be brought to bear on the face of the coal pressure equal to the gas escaping from it, there would be no escape at all. It has been held that the aqueous vapor in a mine, small though it may be, and consisting of two atoms of hydrogen and one of oxygen, may play an important part in forming the materials necessary for an explosion. When the air at a low temperature is taken into a mine, the aqueous vapor seizes with avidity the coal and gases, until in a very short time, the mixture may be at an explosive point. To bring the gas up to an explosive point, there is another important element contributing to it in an atmosphere of low temperature—that is, when temperature is low, the aqueous vapor occupies a much less space and the atoms of oxygen are much nearer together, so that, space for space, under such conditions a less amount of gas will bring the mixture to an explosive point. So it is that in winter there is a keener gas, with a top on the flame, that will fire before it is half the length it will show in warmer seasons. Operatives vary a good deal as to the indications shown by the barometer being as quick as could be desired, but it is known that when coal falls or is cut into the gas is liberated, no matter what the state of the barometer may be. But, as a rule, as soon as there is a movement in the barometer, high or low, then the pressure on the space or pores through which the gas escapes is either less or greater, so that the quantity of gas will be determined by the variation. It has generally been considered that explosions took place with a falling barometer, but now it has been ascertained that many of these fatalities have taken place when the barometer was rising. With such interesting data as have been presented to us, in addition to our previous knowledge with respect to atmospheric influences in connection with explosions in mines, there is no doubt that the question of high pressure will receive more attention on the part of meteorologists in connection with its influence upon the existence of gas in mines. It would not, under any circumstances, be desirable to do away with the barometer at our mines, but at the same time, too much reliance should not be placed upon it, but all known precautions taken to prevent accumulation of gas. This can be most effectually done by sweeping all the working places with copious supplies of fresh air, and so long as this is done, there can be no accumulation of gas, and consequently no explosive mixtures. A mine manager should have no reason for consulting the barometer or thermometer, for it is his duty, strictly laid down by act of Parliament, to provide sufficient ventilation to dilute and render harmless all gases throughout a mine, and so long as he does that he need have no fear of an explosion.—*London Mining Journal.*

A Prospector's Ruse.

How to Head Off Claim Jumpers.

If a prospector escapes the Indians and wild beasts and other natural evils in New Mexico, he is likely to live long enough to fall a victim to the incompleteness of the mining laws there. One of them, who has had considerable experience there since leaving this country a year ago, writes from Socorro county: Every class of society has its freebooters, or those who try to make their living from the labor of others, and in no case are they more numerous than in mining regions. First among these, and the most annoying and persistent, is the claim jumper. Too indolent to hunt up mining claims for himself, and locate them in a proper and legal way, he seeks to take advantage and steal the property of others through some flaw or technicality. Very few miners ever have a legal survey of their claims, or until patent is applied for on them, and the claim jumper takes advantage of this circumstance, and when the original locator comes around to look after his claim that has been jumped, the jumper will say: "Was your claim surveyed?" "No." "Then how can you prove that your claim was located on this ground?" The United States land laws specify that the identity of claims should be fixed by reference in the location notice to some fixed natural object, or some thing by which the location may be identified, but this point locators generally neglect; and herein is the stronghold of the jumper. To head off this class of thieves, I have adopted the following plan, which I give for the benefit of any other locator who may wish to adopt it. When I make a location I write out three notices, one for record, one for posting conspicuously on the land (for which purpose it should be written on a board or, better, on a piece of zinc with a lead pencil, the chemical combination formed by the plumbago and zinc being such that the action of the weather will never efface it), and a third copy on paper, which I place in a tin can (an old oyster can will do), and after closing it up as tight as possible bury the can on the lead where it won't be likely to be dug up, and known only to the locator. The reference to some natural object should also be made, but as this can hardly ever be exact enough in description to identify a claim, if jumped, the buried notice can thus be dug up in the presence of witnesses, which ought to furnish sufficient additional evidence to convince any jury of the proper ownership of the property. This is to head off the petty thieves. In all the country acquired from Mexico under the treaty of Guadaloupe Hidalgo, there is another class who are trying to steal the discoveries of the miners by the wholesale, through the agency of lapsed or fraudulent Mexican land grants. This class can only be headed off by proper Congressional legislation, and the miners have confidence in the wisdom and honor of our present Congress that they will pass a law for that purpose and forever settle this vexed question for the future, which has been such a great drawback to our prosperity in the past.

The Wood River, Idaho, *Times* says that lately a snowslide came down Mayflower gulch, at Bullion, and buried the dwelling of Mr. Dobbins, smashing it into splinters. Mrs. Dobbins was rocking her baby at the time, and was thrown against a heavy chest, her baby under her, a heavy plank pinning her to the floor, and before the lady could be extricated the baby choked to death. Mrs. Dobbins was somewhat bruised, but otherwise uninjured.

New Mining Fan Indicator and Tell-Tale.

At a recent meeting of the Manchester Geological Society, of Wigan, Mr. Hall exhibited and explained a new fan indicator and tell-tale invented by himself. It was, he observed, most important that some automatic apparatus should be attached to all fans to indicate their speed at all hours of the day; and that, if possible, each apparatus should be so placed as to be out of the reach of any interference or tampering on the part of the officials upon whose attention to duty the instrument was intended to act as a check. He believed the presence of such an apparatus would insure greater watchfulness and care from engineers in charge of ventilating engines. The tell-tale which he had brought before them was an inexpensive and simple, yet effective method of securing this end. It could be fitted up in a few hours by any ordinary colliery mechanic, and one of these appliances had already been attached to the large Gilhal fan at the Bickershaw colliery near Wigan, where he believed it gave perfect satisfaction. The apparatus consisted of a specially designed water-gange glass, which was fixed in the manager's office, and leading from this to the fan engine-house—a distance at the Bickershaw colliery of 200 yards—was a range of three-fourth-inch iron pipes, the open end of which was placed within the fan drift; then a short branch of similar piping was joined to these, and the open end placed in the fan engine-house, where it was fixed so as to be within reach of some moving part of the engine that drove the fan, the pipe end at Bickershaw being within reach of the motion of the valve spindle.

A small lever was next attached to this pipe end, with a movement up and down, so as to open and close the outlet of the pipe, and the motion of the spindle played against this, so that at each stroke of the fan engine the pipe end is opened for an instant, and a variation in the pressure of the atmospheric air in the long branch of pipes takes place, causing the fluid of the gauge glass in the manager's office to fall to zero; but immediately the pipe end is again closed by the falling lever, the water-gange glass shows the drag on the water-gauge of the mine, and the result was a perfectly correct and constant indication of the drag of the mine, and also of the number of revolutions the fan was making. This indication taking place in the manager's office, where it could be registered in a book as often as might be convenient, was entirely out of the reach of any interference on the part of the person responsible for the speed of the fan. The fluid in the gauge glass fell to zero at each stroke, so that it was only necessary to count these movements in the glass to determine the speed of the ventilating engine, and the hight of one leg of the fluid over the other between the strokes was the measure or water-gauge of the mine. Where the fan to be indicated traveled at a great speed, each fifth stroke only was dealt with, so as to allow sufficient time to read off the drag of the mine between the indications of the speed, and this was effected by the introduction of two small wheels working at five to one, and deriving their motion from the drag crank of the engine. The cost of the apparatus did not exceed three or four pounds, unless the distance between the manager's office and the fan was very great; but so far as regarded the efficiency of the appliance, distance was immaterial, as it had been tested up to 800 yards. For those who were anxious that the indications should be permanently registered, an eight-day clock could be added, which was fitted with a revolving brass cylinder, carrying a diagram paper upon which a spiral line was drawn by a pencil, indicating the number of revolutions by the fan and the water-gauge during any and every hour of the day or night. In conclusion, Mr. Hall pointed out the advantage of a permanent and indisputable record of the state of the ventilation in the case of such occurrences as the recent explosion at the Abram collieries.

The Southern Pacific railroad is being built through Texas as rapidly as possible. Two construction gangs, consisting in all of 2,000 men, are at work; one having started from El Paso, and the other working westward from San Antonio. It is thought that these two divisions will meet at the Pasos river, which is about 130 miles from San Antonio and 400 miles from El Paso. On the El Paso end of the line over 253 miles of track have been completed, and the work is going on at the rate of about a mile and a half a day. The country is wild and mountainous; deep ravines and gulleys abound, and mountain streams run through precipitous canyons. English steel rails are used in the construction of this road, and most of the supplies are brought from San Francisco.

There are now reported 33 breaks in the levees between Huspuckana and Greenville, on the Mississippi, and terrible suffering is experienced. The steamer *Cannon*, arrived at Vicksburg Saturday. Capt. Campbell says that he rescued over 200 head of cattle, mules, etc., and a number of families from the ends of the levees, and at one place went out into a swamp about a mile and a half for 30 people who were literally starving to death.

It is claimed by local anglers that the salmon which have lately been running up the Pajaro river are not the well-known California or Sacramento river salmon, but are the land-looked salmon that were put in the Pajaro river several years ago.

A Princeton Reunion.

The second reunion of the Princeton College Association of the Pacific Coast, on the evening of the 15th inst., in San Francieco, was a very happy event to those present, recalling scenes and reminiscenoes of earlier and maturer years, which all collegians appreciate. This association, including all who spent some time in the college of New Jersey or Nassau Hall, whether graduates or not, now has on its roll 60 names of those scattered throughout the Pacific States and Territories. With regard to this college, one of the oldeet and most distinguished in the Union, now in its 136th year, a common error has prevailed among those not intimately acquainted with its history. It is oftsn confounded with the equally-noted Preshyterian Theological seminary, which is also located at Princeton, and to which many graduatss of the literary and scientific collsge go when it is their intention to enter the ministry of some Protestant denomination; for many clergy hesidee Preshyterians pass through that seminary. At the literary college, so justly celebrated in the aunale of our country from anti-revolutionary times to the present, many Catholics as well as Protestants have graduated, though its Faculty is composed of eminent ministers and laymen of the Preshyterian church. Drs. McCosh, Atwater and Cameron are dietinguished among the former class, and Profs. Arnold, Guyot and Stephen Alexander among the latter. It ehould he remembered, then, that the college and the theological seminary at Princeton are entirely separate institutions.

More than half the college association for this coast are laymen. Because of the area over which the membere of this association are scattered hut few can attend these pleasant rennione. Thirteen were present at this reunion, ae followe: Rsv. Alhert Williams, class of 1829; Judge John S. Hager, class of '36; Rev. John Edwards, '48; James F. Foulkes, M. D., '49; Maj. Harry I. Thornton, '54; Judge S. F. Bigelow, '57; J. W. A. Wright, '57; Maj. John B. Mhoon, '59; Rev. F. E. Shearer, '62; S. P. Kelly, '65; Rev. J. P. Eghert, '74; Rsv. H. H. Wikoff, '74; D. Wills, Jr., '81. Nearly half the ahove number are natives of Southern States, many Southern parents, hoth hefore and since the war, having eent their sons to Princeton collsge, or, ns it ie familiarly known, far and wide, "Nassau Hall."

The features of thie reunion were a preliminary husiness meeting, nnd an elegant dinner in private rooms of the Palace hotel. Rev. Mr. Williams is president, Major Mhoon was chosen ae secretary, and Major Thornton as a member of the executive committee.

In the husiness meeting a cheering letter was read from Dr. Jamee McCosh, now President of the college, as he hae heen since 1868, when he wae invited from Scotland to accept that position, as Dr. John Witherspoon wns just 100 years hsfore. Among other facts he gave the following numher of etudents for the last 14 echolaetic yeare, ending each Juoe: 1868, 264; 1869, 281; 1870, 328; 1871, 364; 1872, 379; 1873, 376; 1874, 417; 1875. 408; 1876, 483; 1877, 472; 1878, 496; 1879, 495; 1880, 473; 1871, 488; 1882, 537.

In 1868 there were 19 instructore, now there are 37. He hriefly eums up the couree of etudy ae embracing "the more important languagee, ancient and modern, claseical and continental, including Sanscrit and Anglo-Saxon;" and eaye that, of the Englieh language and literatnre there are three profeesore, and in the sciences thirteen, most of them pursuing, hy aid of the etudents, original researchee in astronomy, physics, chemistry, hiology, geology and physical geography. He ehowe that a new chapel, at a coet of $120,000, (the gift of a Mr. Marquard, who formerly preeented the college with a gymnaeium), will he completed hy the next commencement in June. During the last fonrteen yeare, eeveral million dollare, the donatione of individuals, have heen expeuded in the erection of firet-clase stone huildings for various purposes, so that the old collsge ie now ae thoroughly equipped in every respect as ie any institution of learning.

At the hanquet, from 8 to 11 P. M., came a true "feast of reason and flow of soul." Social converee, friendly chat, recitale of college experiencee, interepersed with mirth and jollity, prevailed. All were called on for after-dinner epeechee, and almoet every one took part in them. For the time the great and vaetly changed world of the present wae forgotten, and they lived their college days again. The memories of those present, and the information they gave, extended hack from last year to more than half a centnry.

Several epecial toasts were reeponded to as follows: "Our Alma Mater," Judge J. S. Hager; "Princeton College, as a National Ioetitutioo," J. W. A. Wright; "The South, ae a Patron of Princeton," Maj. H. I. Thornton; "Dr. McCosh, and the Faculty," Rev. J. P. Eghert; "The Princetoo Ministry," Rev. John Edwards; "The Progrese of Princeton," Rev. F. E. Shearer.

Space permite us to give only a few historical facts touching upon Princeton and Princetonians from Judge Hager's remarks. The college was first chartered in 1746. It received a second charter in 1748, and that year graduated its firet class. In 1783 Congrese met in the college buildings. Among the signers of the Declaration of Independence were three Princeton men—Richard Stockton, one of its first graduates, also Benj. Rnsh and President Witherspoon. Eight Princetonians were signere of the Articles of Confederntion, and the following eight were memhers of the Convention which adopted the Constitution of the United States: Gunning Bedford, Wm. R. Davie, J. Dayton, Wm. C. Houston, Lnther Martin, Oliver Ellsworth, James Madison and Wm. Patterson.

Princeton has furnished one President of the Uoited States, James Madison, and two Vice-Preeidents, Aaron Burr and George M. Dallas; also to Congress, 48 Senators and 116 Representatives, 27 of ite graduates heing memhers of the first National Congress. It has furniehed one Chief Justice of the U. S., Oliver Ellsworth, and six Associate Justices, viz.: Patterson, Livingston, Thompson, Johnson, Wayne and Harlan. Of its graduates, 13 have hesn U. S. District Judges, 27 Governors of States, 42 collsge Presidents, 18 Cabinet officere and 16 ministers and envoye to foreign powers. To the judiciary of our States it has contrihuted 10 Chancellore, 64 Associate Juetices and 21 Chief Justices; among the latter, Reeve, of Connecticut; Lewis, of New York; Rush, of Pennsylvania; Booth, of Delaware; Archer, of Maryland; Hutchinson, of Virginia; Nash, of North Carolina; Stone, of South Carolina; Lumpkin, of Georgia; Walker, of Alahama, and Bihh, of Kentucky.

Princeton men naturally review with pride the valuable eervices of their Alma Mater to our country at large, and the solid educational advantages it has afforded to many engaged in the various useful pursuits of life. For the convenience of any youths on the Pacific coast who may wish to enter Princeton, examinations will he held in San Francisco on the 22d and 23d of June next, at a place yet to he designatsd, and of which timely notice will he given.

J. W. A. W.

Associations of Minerals.

Some minerals occur chiefly or exclusively in granite, othere in diorites or echists, others again in limestones, or in volcanic rocks. Moreover, certain minerals are commonly associated with other minerals, forming natural groups, which in some cases appear to have heen formed contemporaneously. It is this latter kind of association which is of so great assistance to the student in enahling him to recognize minerals at sight, much as specimens of the same mineral from different localities may differ in appearance. It is to this association also that the term *paragenesis* primarily applies, hut its meaning has heen extended so as to inclnde all euch associations of minerals in groups, or of minerale which are congenial to each other, as miners say. In the following liets a few of the hetter known examples of paragenesie only are set down. We have distingnished those minerals which have heenfonnd sometimes *enclosed* in the species referred to by printing them in italics:

Quartz is associated with orthoclase, *mica, tourmaline, chlorite*, chalyhite, calcite, dolomite, harytes, fluor, *cassiterite, pyrites, chalcopyrite, limonite, hematite, gothite*, wolfram, cuprite, *copper, galena, blende*, hournonite, gold, etc.

Calcite, with *quartz, copper, chalcopyrite, pyrites*, etc.

Apatite, with hornhlende, axinite, magnetite, garnet, topaz, echorl, cassiterite, wolfram, qnartz, orthoclase.

Barytee, with galena, oalcite, hlende, chalcopyrite, pyrites, etc.

Argentite, with etephanite, arsenic, pyragyrite, etc.

Caeeiterite, with qnartz, echorl, chlorite, miepickel, pyritee, hlende, wolfram, topaz, lepidolite, etc.

Chalcopyrite, with qnartz, finor, galena, hlende, chalybite, dolomite, pyritee, calcite, etc.

Galena, with qnartz, pyrites, chalcopyrite, hlende, calcite, etc.

Pyrites, with quartz, caesiterite, chalcopyrite, galena, fluor, miepickel, limonite, cohaltite, emaltite, inverarite, etc.

Cuprite, with quartz, copper, malachite, cheeylite, fluor, etc.

Fluor, with quartz, wolfram, chlorite, orthoclase, chalyhite, calcite, etc.

Garnet, with *magnetite*, apatite, epidote, talc, mica, hornhlende, limonite, etc.

Serpentine, with steatite, diallage, aeheetoe, copper, chryeocolla, calcite, chromite and nickel ores.

Sulphur, with celeetite.

Tellurium, with gold, hismuth.

Plationm, with iridium, rhodium, palladium, etc.

Gold, with quartz, tellurium minerale, etc.

Cinnahar, with tetrahedrite, quartz, calcite, etc.

Magnetite, with chlorite, garnet, hornhlende, etc.

In the Blue Wiug eilver dietrict, eaet of Bannack, Montaoa, there are more miners at work nt the present time than there have heeo for a oumber of yeare paet. Many of the mines of that district are looking well, and are producing a good quality of ehipping ore. The Blue Wing dietrict is looming up, and the ore yield for thie winter will he of considerahle value.

All machinery and apparatus has been taken out of the Belcher helow the Sutro tunoel level. The usual amount of low grade ore is hsing extracted above that point.

In Candelaria wood selle at $16.50 and $17 a cord. Rough lumher ie delivered at $48 per 1,000 ft., and at $61 per 1,000 ft., for dreseed. Shingles are rated at $6.50 per 1,000.

Copper Mining and Smelting.

The copper interest of the conntry ie developing into one of so much importance that any substantial improvement in the appliances for reducing thie class of ores will attract general attention. The following letter from the Superintendent of the Copper Queen mine in Arizona, giving an acconnt of the operation of an improved style of emelter in use there, will he read with much intereet hy all parties in any way connected with this class of mines. There is prohahly no more promising field of mining ventnre than that now offered in copper. The consumption of this metal is increasing so rapidly that the price is constantly advancing in the face of increased production. Copper mining is a great and growing industry, and the recent development in nll the mining States and Territories are a surprise even to thoee moet familiar with the mineral resources of the conntry. It is the oninion of many well informed upon the suhject that the production of copper will in the future rival in value that of the preoious metals. There are douhtless many other mines where snccess equal to that mentioned might he made with a judicious investment of capital. There is no douht of the fact that this class of mining has so far heen immensely profitahle, and with suoh improvements in the proeese of reduction, the ohances of lose or failure, with good management, are reduced to a minimum:

OFFICE OF THE
COPPER QUEEN MINING CO.,
BISBEE, A. T., Jan. 3, 1882.

Messrs. RANKIN, BRAYTON & Co.. "Pacific Iron Worke," San Francisco, Cal—GENTS: In answer to your inquiriss for some particulars in regard to the operation of your furnaoss at the Copper Queen mine, would say, that we have had one thirty-ton smelter in hlast almost constantly since the 20th of August, 1880. The second smelter, of eame capacity, was put in hlast on the 28th day of August last, and has heen runuing ever since, without an hour'e intsrmission. We pnt through something over 30 tons of ore per day to each smeltsr, exclusive of flux, and our average hullion product from the two furnaces is from 25,000 to 27,000 pounde per day, running from 96.5 to 98 fine. Our record for the year 1881 showe a production of nearly 5,000,000 pounds hullion—the prodnct of one smelter running continuonsly, and one only four months of the year.

On acconnt of the scarcity of timhsr for making charcoal in our locality, we use coke for fuel—mostly English—though we have occasionally ussd Trinidad iu connection with it.

To illustrate the facility with which these furnaces can he managed, would etate that in several instancss, when our coke supply has hecoms short, I have hanked the fires for several days at a time and etarted the stream of hnllion again in fifteen minutes after putting on the hlast. The furnacss are adapted to any class of copper ores, are eimple in construction, easily handled, and with proper care are alwaye in order. I have had more than 20 years' experience in copper emelting, and have never eeen a furnace that can compare with yours for reliahle, effective and economical work; in fnct, I know of no other furnace now made that will handle euceessfnlly the copper ores of the Western Statee and Territories. The general character and details of the emelting plnnte furniehed hy yonr firm, I may aleo eay, are well adapted to the husinees and fnlly meet all requirements.

I make thie etatement in the general interest of the emelting hueineee of the country, and as due to your energy and enterprise in working up to euch a etate of perfection thie important hranch of mining machinery. Yonrs trnly,

LEWIS WILLIAMS,
Superintendent of Furnacee of Copper Queen Mining Company.

NOTE.—These emeltere were made from plane furniehed hy Meesre. Bishee, Williame & Co., a firm which hae heen long recognized ae the higheet authority on this coast in all mattere relating to the treatment of copper and galena ores. Tho Williame Bros. are widely known as the moet experienced and ekillfnl emelters in the country.—*Arizona Star.*

GEN. GEO. B. MCCLELLAN ie President of the Silver City M. & M. Co., of Grant county, New Mexico. Mr. Henderson ie Superintendent. Thie company hae acquired all the interests in Grant county of the late Carrolton company. The property purchaeed by the new company comprisee the etamp mill and machinery in town, the Old Timer and Volcano mines in the Silver Flat mining district, and the Camphellite, near the Coeette. They will prohably renew the negotiations which their predecessore commenced for the purchaee of eome of the claims of Frank Biehy. Some of the other officers are John B. Scott, Vice-Preeident, Wm. T. Mieereau, Treasurer, Mr. Gray and Mr. Cummings, Directore.

SUPERINTENDENT RHODES, of the Humholdt sulphur minee, telle the *Silver State* that new doposite of brimetone have have heen found in the minee receotly which are more extensive thnn any heretofore discovered. Some ten men are at work in the minee at present, and the force will he increased ae soon ae the road is in condition to haul the refined eulphur to the railroad. The new deposite will enahle the company to ehip any quantity of eulphnr during the coming enmmer.

Ores of Copper.

Copper ocnrs very ahundantly, and in a variety of forms; hut many minerals oontaining it are muoh too poor in copper to allow of its profitahle extraction, or do not occnr in sufficient haundance to permit of their olassification as oree of copper, and such aocordingly will not he noted in this place. The ores of copper occur in rocks of almost all ages, hut most ahundantly in the Lias nnd Permian formations, the lodes of Cornwall occurring in Permian and older rocks, and the oree are most frequently accompanied hy iron pyrites and qnnrtz, while in some Cornish mines fluor-spar occurs largely. The metal ocnrs in the native or metallic state, also as oxide, eulphide, carhonate, chloride, sulphate, phosphate, and silicate, etc., of copper.

Native copper is found in isolated masses, sometimes of considerahle size, in thin laminæ, or in filiform pieces, and the copper sand, or harilla occuring in Chili, consists of metallic copper in small graine, mixed with qnartz; occasionnlly a mass of copper ore will consist of carhonate of copper on the ontside, enveloping an inner layer of red oxide, itself enclosing an inner nucleus of metallic copper. Native oopper ie ductile, malleahle, and exceedingly tough; it ie usually very pure, hnt is often nccompanied hy small quantities of silver; in Chilian varieties the latter occasionally amounting to 7% or 8% of the metal. The chief localities of its occurrence in quantity are Michigan, Arizona, Brazil, Chili, Peru, Siheria, Faroe Isles, in some of the Cornish mines, also in North Wales, and in smaller quantities not unfreqnently along with other copper oree in the varions loealities of their occurrence.

The red oxide or cuprite contains, when pure, 88.78% of copper, and is found massive or granular; frequently iron-grey on the surface, hut alwaye affording its characteristic reddish-hrown streak. It ocoure at Hnel Gorland and other Cornish mines, in New Jersey and the district of Lake Superior, hut most ahnndantly in Australia.

The hlack oxide contains, when pure, 79.8% of copper, hut it is frequently very impure. It occurs in Lake Superior, in Saxony, Chili, and at the Burrn Burra mines of Australia.

Green carhonate of copper, or Malachite, contains 57% of copper, nnd is distinguished hy its fine emerald green color, with a luster inclining to resinous, and a streak of a eomewhat paler tint than the mineral in the mass. It oocurs massive in the Ural mountains, in Sonth Australia, Siheria, the United States, and South America, and incrusting other ores in most copper mines.

Azurite, Cheesylite, or hlue carhonate of copper contains 55.16% of copper, and ocours along with the green carhonate of copper in Australia, as also in Cornwall, Chessy, in France, and in the United States.

Copper pyrites, or yellow copper ore, forms the ore from which ahout five-sixths of the copper produced in Great Britain is ohtained. Its formula showe it to contain, if pnre, 34.81% of copper; hut ite average yield as prepared for sale ie only from 4% to 12%, or uenally 7% to 8% of copper. Thie ore is of a hrase-yellow color, dietingnished from iron pyrites, which it reeemhlee, hy ite inferior hardnese; it ie fonnd associated with qnartz, gneise, and clay-elate, and occure in large quantitiee in Cornwall and Devon, accompanied hy grey copper ore, galena, hlendee, copper glance, tin stone, etc.; it ocenre aleo in Sweden, Saxony, Cuha, South America, the United Statee, Anetralia, and eleewhere.

Vitreoue or grey enlphide of copper, copperglance or redrnthite and purple oopper, are enlphidee of copper occurring largely in Cornwall and elsewhere, aeeociated with hæmatite iron ores, and containing variahle proportione of eulphide of iron; a variety of the purple ore occure in the cupriferoue ehale of Manefeld, in Saxony.

Grey copper ore, fahlerz, or fahl-ore, is a steel-grey or iron-hlack, hrittle mineral, occurring hoth maeeive and crystallized in cuhic forms. It is a cuprone sulphide, in which the copper ie replaced more or lees hy iron, zinc, eilver, and mercury, along with variahle proportions of the sulphidee of antimony and areenio. The argentiferone fahl-ore contains occasionally 30% of eilver, and not more than 15% of copper; whilet others contain as much ae 48% of copper, with hut emall proportione of eilver. Gold ie also eometimee a conetituent of thie ore. Fahlore occure in Cornwall, Norway, Sweden, Hungary, the Hartz, Mexico, etc.

Chrysocolla, a hydrated eilicate of copper; and Atacamite, a hydrated oxychloride of copper, are eometimee employed for the extraction of the metal. The former occure accompnnying other copper oree in Cornwall, Saxony, Nova Scotia, Chili, Auetralia, and Lake Superior; and the latter is aleo fonnd in Chili, Auetralia, Saxony, etc.

Cupric eulphate oocure in coneiderable proportion in the watere iesning from certain copper minee, ae thoee of Amlwch, Wicklow, the Rio Tinto, and Thareie mines of Spain, etc.

THE Silver City Miners' Union have elected the following officers: G. M. Holmes, Preeident; E. Hamilton, Vice-President; H. V. Angell, Recording Secretary; George Langridge, Fioancial Secretary; Joleee Lawson, Treaeurer; A. Dickson, Conductor; J. Martin, Warden; Frank Clemente, Frank Frame, Frank Howard, George Page and D. J. Elliott, Trustees.

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G HANKS, State Mineralogist.]

[CATALOGUE.]

3657 Rhodonite and Pyroluaite—Section 14, Township 1 north, range 16 east, M. D. M., 2 miles south of Summersville, Tuolumne county, Cal. W. A. Lewis.

3658. Silver Ore—Plumosa mine, Ures district, Sonora, Mexico. F. E. Monteverde.

3659. Silver Ore—San Miguel mine, Ures district, Sonora, Mexico. F E. Monteverde.

3660. Silver Ore—Cocinera mine, Ures district, Sonora, Mexico. F. E. Monteverde.

3661. Copper Ohance—Bacamaca-l mine, Sinaloa, Mexico. F. E. Monteverde.

3662 Float Silver—Uralama mine, Alamos district, Sonora, Mexico. F. E. Monteverde.

3663. Silver Ore—Quintera mine, Alamos district, Sonora, Mexico. F. E. Monteverde.

3664. Silver Ore—Joya mine, Sinaloa, Mexico. F. E. Monteverde.

3665. Schoellto—Near Seattle, Washington Territory.

3666. Cuproschoelite with Tourmaline—Kern county, Cal.

3667. Yellow Brick—Made from the alluvial soil of the Rio Grande, which is free from iron. Cost $6 per 1,000. S. W. Holliday.

3668. Ear Ornaments—Made and worn by the natives of the East Indies Miss F. Von Lindner.

3669. Rock specimen—Of peculiar interest, which consists of alternate layers of quartzite and limestone. On the weathered surface, the limestone has been cut away, probably by the action of drifting sand, while the quarzite remains clear and sharp. This specimen is an interesting study, the question suggesting itself how the two minerals were deposited so evenly and with such alternate regularity. When found, the strata were vertical. Locality, Inyo range, 2,000 ft. above Owen's valley, Inyo county, Cal. W. W. S. D. Woolhull.

3670. Fragment of Bone of Mastodon (?)—Taken from the soil 80 ft. below the surface, Bowie station, S. P. R. R. The molars are in the museum of the California Academy of Sciences. S. W. Holliday.

3671. Globular Pyrites in Calcite—Near Auburn, Placer county, Cal. Miss F. Von Lindner.

3672. Pig Iron—First run on ores from Taxada Island iron mines. C H. Simpkins.

3673. Stream Tin—Near Parrvilla, Durango, Mexico. John B. Phillipin.

3674. Magnetite Loadstone (Natural Magnet)—Magnet Cove, Arkansas. J. Z. Davis.

3675. Piece of Tusk of Fossil Elephant—Placer county, Cal. D. C. Stone.

3676. Vein Matter, Gold Bearing—Golden Crown mine, Coulterville mining district, Mariposa county, Cal. A. W. Owen. This specimen is remarkable as showing the effect of solfataric action in the vein.

3677. Concretionary Cinnabar—Washington mine, Napa county, Cal. S. A. Coburn.

3678. Rock Specimen (Anamesite? with Section for the Microscope by Mellville Attwood—Culebra hill, Panama canal locality, Isthmus of Panama. M. Eissler.

3679. Rock Specimen (Anamesite?) with Section by Mellville Attwood—Cerro La Peta Imperador, Panama canal, Isthmus of Panama. M. Eissler.

3680. Conglomerate with Section by Mellville Attwood (Anamesite?)—Panama canal locality, Isthmus of Panama. M. Eissler.

3681. Rock Specimen (Not Determined)—Voisluage Imperador, Panama canal locality, Isthmus of Panama. M. Eissler.

3682. Rock Specimen (Not Determined)—Cerro Malo Rio, Panama canal locality, Isthmus of Panama. M. Eissler.

3683 Rock Specimen (Not Determined)—Chutes d'Obispo, Panama canal locality, Isthmus of Panama. M. Eissler.

3684. Rock Specimen (Not Determined)—Petites Chutes d'Obispo, Panama canal locality, Isthmus of Panama, M. Eissler.

3685. Rock Specimen (Not Determined)—Imperador, Clay, Panama canal locality, Isthmus of Panama. M. Eissler.

3686. Soundings—Carboe, Panama canal locality, Isthmus of Panama. M. Eissler.

3687. Coal—Isthmus of Darien. M. Eissler.

3688. Borings—Blanchet shaft, Panama canal, Isthmus of Panama. M. Eissler.

3691. Coal—Hank Mitchell's mine, 15 miles from Eureka, Eureka county, Nev. Hank Mitchell.

3692. Blue Calcite—San Diego county, Cal. W. H. Green.

3693. Rock Specimen (Not Determined)—Cut into cube and polished. Spanish Park canyon, Utah county, Utah. J. W. Hood.

3694. Silver Ore—Penobscot mine, 25 miles from Helena, Montana.

3695. Wall Rock with Dendrites—Vulture mine, Yavapai county, Arizona.

3696. Rich Copper Ore—Mountain Gem mine, Genesee, Plumas county, Cal. Johnson & Bicknell.

3697. Thinolite—Desert near Volcano station, S. P. R. R., San Diego county, Cal.

3698. Small Pebbles of Pumice Stone—Colorado desert, 5 miles west of Volcano station, S. P. R. R., San Diego county, Cal.

3699. Selenite—Colorado desert, 5 miles west of Volcano station, S. P. R. R., San Diego county, Cal.

3700. Andalusite—Moore's hill, 12 miles south of Mariposa, Mariposa county, Cal. Richerd B. Thomas.

3701. Quartz and Pyrite—Both crystallized. El Dorado county, Cal. E. W. Hulford.

3702 Twenty-five Samples of Mexican Woods—F. E. Monteverde.

3703. Gold Quartz—Soulsby mine, Tuolumne county. See No. 912. John Seechman.

3704. Silver Ore—Twins mine, three miles southeast of Calistoga, Napa county, Cal. Said to assay $50 per ton. J. H. Crossman.

3705. Gold Quartz Showing Free Gold—Sheep Ranch mine, Calaveras county. Walter P. Jenney.

3706. Rose Quartz—Hope valley, Alpine county, Cal. Lewis Chalmers.

3707. Rose Quartz—Yokhe (?) valley, Tulare county, Cal. Thomas Osborn.

3708. Rose Quartz—Plumas county, Cal. H. Ergels.

3709. Iceland Spar—Darwin, Inyo county, Cal. S. D. Woodhull. This spar is nearly as fine as the true Iceland spar, and could be used for optical purposes.

3710 Quartz Crystals Doubly Terminated—Beveridge district, Inyo county, Cal. S. D. Woodhull.

3711. Chrome Iron—Michigan Bluff, Placer county, Cal. S. W. Collins.

3712. Siderite (Carbonate of Iron)—Tejunga canyon, Los Angeles county, Cal. Occurs in a quartz ledge, country rock, granitic. J. W. Redway.

3713. Silver Ore—Henrietta mine, Wagonton, nine miles from Silver City, Idaho. The face of this hoe specimen is covered with crystals of argentite(?). A. L. Simondi, assayor, Silver City, Idaho.

3714. Rich Copper Ore, Principally Cuprite—Mammoth copper mine, Mono county, Cal. J. E. Johnson.

3715. Gold Quartz—Hite mine, Hite's cove, Mariposa county, Cal., 900 level. See No. 1344. N. J. Colman.

3716. Chromic Iron—Within one mile of Auburn, Placer county, Cal. S. P. Collins.

3717. Limonite after Pyrite—Perfect crystals. Chowchilla valley, Mariposa county, Cal. Richard B. Thomas.

3718. Silver Ore (?)—Railroad mine, Los Angeles, Los Angeles county, Cal.

3719. Gold on Quartz Crystal—Beveridge district, Mono county, Cal. The gold has the appearance of having been formed in the crystal, but close inspection shows that it is cemented on the outside by oxide of iron. J. H. Holt.

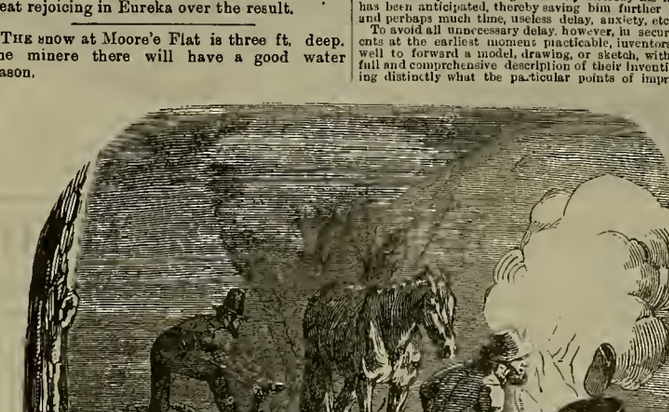
3720. Gold Quartz—Pioneer Union mine. Humbug mining district, Placer county, Cal, 300 ft. below the croppings, ledge 4½ ft. thick. E. G. Spencer.

THE mining interests in the eestern part of Churchill county, Nev., ere, according to a correspondent of the *Silver State*, brightening up, and hid fair to become reliable end valuable property. At Silver Hill, 20 miles east from Stillwater, work is being pushed on the No. 1 with a double force of men. The lode ie now exposed for 100 ft. At a depth of about 50 ft., it is in free milling ore, and assays run from $100 to $700 per ton in gold and silver. Parties from San Francisco have recently made two visits to the mine, and say that they will erect a mill on the property in the early spring. The Goodell camp, situated about 20 miles further east, is said to present most flettering prospects.

PREPARE FOR BUSINESS LIFE.—If parents would only see tn it and properly prepare their boys for business before trying to get them into business, they would save great trouble to themselves, the boys and their employers. Moreover, the boys would have some basis to begin with and to build upon, and instead of spending a year or two learning tbo rudiments and general principles, would begin active work with a knowledge of them already. If such preparation could nôt be made without great trouble and expense, there would he some excuse for people taking "green" boys around trying to get them places. But when there are such institutions as the Pacifio Bnsiness College, where a life scholarship can be had for $70, there is no reason why parents should not help the hoys out and give them a good start. There they will learn the mysteries of hook-keeping in all ite branches, learn to write well, and learn practical business details. When they leave they go prepared to he of some use to their employers, instead of a drag and a source of annoyance, as must he tbe case when everything is to be learned. The case does not admit of argument. Anyone with a boy destined for business pursuits, who negleote to give him the advantages of such an institution, if it is in his power, is responsible for the hoy's heckwardness in business, and the direct cause of his slow advancement.

THE RICHMOND-ALBION SUIT.—In the Richmond-Alhion (of Enreka) mining suit, the Supreme Court decided the St. George and Victoria patents void and reversed the judgment of the District Court. This decision virtuelly givee the Alhion company about all they claimed. According to the *Sentinel* there wes great rejoicing in Eureka over the result.

THE snow at Moore'e Flat is three ft. deep. The minere there will have a good water season.



PROSPECTORS IN CAMP.

THE EAGLE LAKE TUNNEL.—The tunnel to tap Eegle leke is being advanced at the rate of 35 ft. per week. It will he about a mile and a half long, and it is expected thet it will he completed next fall. It will furnish water power for rnnning several sew-mills, and finally will irrigate a greet area of now harren sage-hrush land in Honey Lake valley. The tapping of this lake is an experiment that is heing watched with great interest everywhere on the coast. Shonld it prove as successfnl as is anticipated, it will he followed hy a similar tapping of many other lakes on hoth sides of the Sierras, for mining, timhering end other purposes.—*Virginia Enterprise, March 17.*

THE Assooiated Pioneers of the Territorial Daye of California—a New York organizetion—has issued an appeal to California pioneers everywhere to come forward with cesh for a monument to the late John A. Sutter. Sutter was e noble Celifornian, to whom the early pioneers were deeply indehted, and to whom the United States itself owes a deht.

THE Honse Private Land Claims committee, hy a vote of five against two, decided to recommend the passage of a hill providing for the adjudicating of McGarrahan's claim to the rancho Panoche Grande, California, hy the Supreme Court of the District of Columhia, with an appeal to the Supreme Court of the United States.

THEY increased the capacity of the pumps the other dey at the Alta hy making an alteration in the pecking. Heretofore, the harrels of the pump have been stuffed to an interior diameter of 8 inches. This stuffing has been taken out, giving the harrels their full diameter of 10 inches, the poles heing packed to correspond.

ON the 17th a enowslide completely demolished the 40-stamp qnertz mill known as the "Hank's mill," in Sierra county, Nevada. The mill is situated at the hase of a precipitons mountain, and the snow coming down from above buried it.

Patent Business.

Patents Are Virtually Contracts

Between Inventors and the public. The considerstion flowing from both parties to the contract is expressly fixed by statute. The Government requires the following consideration in every case: First, that an applicant for a patent shall disclose a new and useful improvement, of which he is the first and original inventor. Second, that the invention has not been patented, or published in a printed publication, prior to the date of his *invention*. Third, that the invention has not been in public use, or on sale, more than two years prior to his application for a patent. Fourth, that the invention shall be properly described and claimed in the specification forming a part of the patent. Provided an inventor complies strictly with these conditions, the Government guarantees to at the inventor shall have the exclusive right to make, use and sell the thing invented for the term of 17 years.

The Patent Law provides that in case a patent, which is the evidence of the contract, is not executed in compliance with the requirements of the law, it may be annulled and rendered void. Hence, it is of the greatest importance to every inventor that his patent or contract be skillfully and accurately drafted, that it may afford him complete protection for his invention during the life of his patent.

Secure a Good Patent.

An inventor should first ascertain whether or not his improvement has been patented to another. This requires an exhaustive search among all the patents in the class to which the invention relates. This question can often be answered gratuitously by us immediately on receiving full information of the invention, by reason of our long and extensive practice as patent solicitors and editors and publishers of first-class scientific and industrial journals during the past 20 years and over. When the question of priority of invention is not so readily to be determined, it is generally best to make what is termed a "preliminary examination," by searching through the patent office reports among the patents in the class to which the invention relates, and referring to our extensive patent library, containing compilations of special classes of American and foreign inventions, mechanical dictionaries, scientific encyclopedias, files of scientific and mechanical newspapers, and an immense number of patent applications by inventors of the Pacific coast, carefully filed by this office since 1860.

If, by this "preliminary examination," the improvement is found to have been previously invented, our client will receive for the small fee of $5 for the examination a verbal or written report showing definitely whereby his invention has been anticipated, thereby saving him further expense, and perhaps much time, useless delay, anxiety, etc.

To avoid all unnecessary delay, however, in securing patents at the earliest moment practicable, inventors will do well to forward a model, drawing, or sketch, with a plain, full and comprehensive description of their invention (stating distinctly what the particular points of improvement are), with $15 as a first installment of fees. If the improvement appears to us to be novel and patentable, the necessary papers for an application for a patent will be prepared immediately, and forwarded to the inventor for his signature. When the inventor receives the application and finds it duly prepared, he will carefully sign and return the same plainly addressed to us, with postal money order or express receipt for our own fee. The case will then be promptly filed by us in the Patent Office, and vigorously prosecuted to secure the best patent possible. [This course is the most expeditious and satisfactory, as no time is lost in transmitting correspondence relative to the preliminary steps to be taken.] When the patent is allowed, the inventor will be duly notified, and on sending the final Government fee of $20 to us, we will order the issue of the patent, and forward the same as soon as it is secured from the Patent Office.

The payments are thus divided and made easy. We make no pretence of doing cheap work, in order to entice custom, nor do we afterward make additional charges to bring the bill up to a fair compensation. We do our work honestly and thoroughly, and we never give a case up as long as there is a chance to obtain a patent. The Agency charge is from $25 to $30, or sometimes more, if the invention is intricate or complicated, or requires much labor. Drawings cost from $5 upward, according to their number and the time employed; and, if a model is sent, the express charges upon this and the papers must be added. The total cost, in addition to Government fees, rarely exceeds $10, and for this we do all we can without appealing the case.

When the inventioo coosists of a new article of manufacture, or a new compesition, samples of the separate ingredients sufficient to make the experiment, and also of the manufactured article itself must be furnished.

Modele and Drawings

Models are now seldom required by the Commissioner of Patents, and generally ooly in intricate cases. Perfect drawings of practical working machines ere considered more satisfactory to the Patent Office than the old and more cumbersome system of storing up an immense hulk of almost numberless models.

Drawings or sketches sufficient to illustrate clearly the invention, with a sufficient description to enable us to make a full set of perfect drawings for the Patent Office is all that we require. A model will answer our purpose as well, however, in cases where the iuventor can more easily furnish it for our use.

The value and even the validity of a patent often depends on the character, clearness and sufficiooy of its drawings. There are thousands of existing patents in which the improvements are but partially or very poorly illustrated in the drawings. When an attempt is made to dispose of such patents, the vagueness and defects of the drawings often prejudice capitalists and manufacturers against the invention, while in reality it may be of great value, and would meet with ready sales had the invention been fully portrayed by artistic and skillfully executed drawings. Again, when patents of this character are brought into court, the uocertainty and ambiguity of the drawings enable the opposing experts to mystify the judges as to the construction or combination of parts intended to be covered by the patentee. In all cases prepared by us, the drawings are made under our personal supervision, by skilled draftsmen in our constant employ, and every precaution is taken that the invention is fully and clearly shown by different views, so that the improvement will be readily understood by the Examiners in the Patent Office, and comprehended by the public when the patent is granted.

In the Patent Office

The application is assigned to the Examiner having charge of the class to which the invention relates. The case must then take its turn with others in the order of filing, and in due time is carefully examined to test the novelty of the invention. If the Examiner fails to find anything that anticipates the invention, a patent is immediately allowed, provided the specification and claims are drafted in proper form. Should the Examiner find a prior patent which, in his opinion, anticipates one or more of the claims of the application, a letter of rejection is sent to the attorney in charge of the case; and if the attorney coincides with the views of the Examiner, the claims rejected are erased. In preparing applications for patents, an attorney should be careful to familiarize himself with the class of inventions to which the application pertains, so that the specification and claims may be drafted as nearly perfect in the first instance as is possible. This course saves much time in prosecuting the application to a patent.

When claims are improperly rejected on patents which do not anticipate the spirit or wording of the claims, proper steps are immediately taken to convince the Examiner of his error. This is done, in most part, by personal arguments, as the differences in construction, operation, function and results are more readily discovered and appreciated by an oral presentation of the facts than can possibly be done by relying solely on written arguments. In order that the Patent Office record of the patent shall be complete, an oral argument is generally supplemented by a manuscript brief, that others, in examining the files at any future time, may clearly comprehend the position taken by the Examiner and attorney in prosecuting the case to patent.

In addition to our own personal attention to the interests of our clients here, we have, for over 12 years past, had constantly in association with us in Washington, one of the soundest legal counselors and ablest of practitioners in patent business in this country, who carefully attends in person to our business at the Patent Office and has attained success in a most marked degree.

Perfect Claims.

The value and force of a patent are dependent on its claims. A patent may disclose to the public the most important and valuable invention, and yet the claim be of such meager scope that the patent is actually worthless. When the claims of a patent are so loosely drafted that infringers can flood the market with improvements, differing from the improvement disclosed by the patent only in slight changes in construction and arrangements of parts, such a patent is valueless to the owner, as it fails to afford him that exclusive and complete protection guaranteed by the Patent Law. Hence it is that the greatest care, skill and perseverance are required, first in properly drafting the claims in the first instance, and, second, in prosecuting the application before the Patent Office, and maintaining the rights of the inventor to claims as broad and sweeping as the invention will warrant. This latter is no easy task. The Examiners of the Patent Office serve in the capacity of attorneys guarding the interests of the public. It is their sworn duty to exercise the greatest care and watchfulness, that patentees do not secure claims of greater scope than they are justly entitled to. It is but natural that Examiners are sometimes in error as to just what scope should be accredited an invention. Although the Examiners act under honest convictions in cases where they refuse an inventor his just rights, yet it is the duty of the attorney to maintain the claims of his client, if he is convinced that they are just and proper. To succeed in this requires the display of tact, firmness and ability; and when the Examiner is made to see that the inventor is honestly and fairly entitled to the claims which have been rejected, he will almost invariably recede from his former action, and allow the case.

Advantagee to Inventore on the Pacific Coaet.

The firm of DEWEY & CO., (continuously editors and publishers of the MINING AND SCIETIFIC PRESS, nearly from its early commencement in 1860), offer comparatively far better facilities to the local inventors of the Pacific States and Territories, than are possessed by any other agents in America. Members of the firm give personal attention to the applications entrusted to their care. They have been longer in practice in patent soliciting than most agents who are still personally engaged in the business. They have secured more U. S. and forelgo patents in the past 20 years (with very few exceptions) thao any other firm still existing. Their practice has been so successful and long continued that the great majority of inventions on this side of the American continent have been patented through their agency, thus affording them great and valuable experience, by thorough information of the true principles and points of novelty in the inventions, whether general in character or peculiarly local to this coast.

The extensive business combination and experience of this firm is undoubtedly one of the most fortunate in existence for affording inventors prompt and reliable advice and the best possible facilities for securing their full patent rights with safety and dispatch at uniformly reasonable rates.

Every patentee of a worthy invention is guaranteed the gratuitous publication of a clearly stated and correct description of his invention in one or more of our influential and reliable newspapers, affording just the circulation that is best calculated to widely inform the class of readers most specially interested in the subject of his invention.

Saving of Time, Etc.

Inventors on this coast will find that owing to our familiarity with inventions and local affairs of this coast, we can more readily and fully comprehend their wants, and thus save much of the time ordinarily consumed in preliminary writing back and forth when distant agencies are employed.

Caveats.

A Caveat is a confidential communication made to the Patent Office, and is therefore filed with its secret archives. The privilege secured under a caveat is, that it entitles the caveator to receive notice, for a period of one year, of any application for a patent subsequently filed, and which is adjudged to be novel, and is likely to interfere with the invention described in the caveat, and the caveator is then required to complete his application for a patent within three months from the date of said notice. Caveat papers should be very carefully prepared. Our fee for the service varies from $10 to $20. The Government fee is $10 additional.

To enable us to prepare caveat papers, we only require a sketch and description of the invention

Rejected Applications.

Inventors who have rejected cases (prepared either by themselves, or for them by other agents), who desire to ascertain their prospects of success by further efforts, are invited to send the papers of our unrivaled facilities for securing favorable results. We have been successful in securing Letters Patent in many previously abandoned cases. Our terms are always reasonable.

Inventors who do business with us will be notified of the state of their application in the Patent Office, when it is possible for us to do so.

DEWEY & CO.,
Patent Solicitors, Office of MINING AND SCIENTIFIC PRESS,
252 Market St. Elevator entrance, No. 12 Front St., S. F.
GEO. H. STRONG. W. B. EWER. A. T. DEWEY.

THOSE who think the hydreulic miners are responsible for all the slickens that is precipiteted into the valleys should take a look at our rivers that flow from the regions where mining is unknown. The water is of the consistency of thin porridge.—*San Jose Mercury.*

IT is said that the telephone refnses to work in the deep mines on the Comstock. The magnets rnst in e few hours, so nothing goes through. Some were tried in the Sutro tunnel, inclosed in air-tight hoxes, hut they failed to operate.

GALENA and copper ores are just now attracting more ettention than any others, there being a great demand in that direction.

PILGRIMS are coming to Butte ehout e month too soon—so says the *Inter-Mountain*, and it ought to know.

WE learn that the Martin & Walling mine, near Coulterville, has shut down.

SILVER-COPPER ore is being shipped from Montene to Baltimore.

CHICAGO **FRASER & CHALMERS,** ILLINOIS.

MANUFACTURERS OF IMPROVED AND APPROVED FORMS OF

MILL AND MINE MACHINERY.

Having made extensive additions to our Shops and Machinery, we have now the LARGEST and BEST APPOINTED SHOPS in the West. We are prepared to build from the Latest and Most Approved Patterns,

QUARTZ MILLS

For working gold and silver ores by wet or dry crushing. The Stetefeldt, Howell's Improved White, Brunton's & Bruckner Furnaces, for working base ores. Rotary Dryers, Stetefeldt Improved Dry Kiln Furnaces.

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Water Jackets, either Wrought or cast iron, made in sections or one piece, either round, oblong, oval or square. Our patterns most extensive in use. SPECIAL FURNACES FOR COPPER SMELTING. Slag Pots and Cars, improved form. Bullion and Copper Moulds and Ladles, Litharge Cars and Pots, Cupel Furnaces and Cars.

HOISTING ENGINES

Large or Small for flat or round rope. Double Cylinder Engines, from 6x10 to 18x60. This latter size furnished J. B. Haggin for Giant and Old Abe Co., Black Hills also Corliss Pumping Engines, 20x60, for Hoisting and Pumping Works, for 2,000 feet deep. **Baby Hoists for Prospecting, 4 H. P. to 6 H. P.**

Wire Rope, Safety Cages and any Size and Forms of Cars. **McCaskell's Patent Car Wheels and Axles—Best in Use.**

Principal Office and Works, Fulton and Union Sts., Chicago, Illinois. New York Office, Walter McDermott, Manager, Room 32, No. 2 Wall St.

Frue Ore Concentrator, or Vanner Mills.

Coarse Concentrating Works, Improved Jigs, Crushing Rollers, Sizers, Trommels, Rittenger Tables, and all other adjuncts for the proper working of Gold, Silver and Copper Ores, complete in every detail.

HALLIDIE IMPROVED ORE TRAMWAYS. We refer to Gen. Custer mine, Idaho, 5,000 feet long; Columbus Mine, Col., 4,750 feet long; Mary Murphy mine, Col., 5,000 feet long, all in constant operation.

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Improved Corliss and Plain Slide Valve Meyer's Cut-off Engines.

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HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

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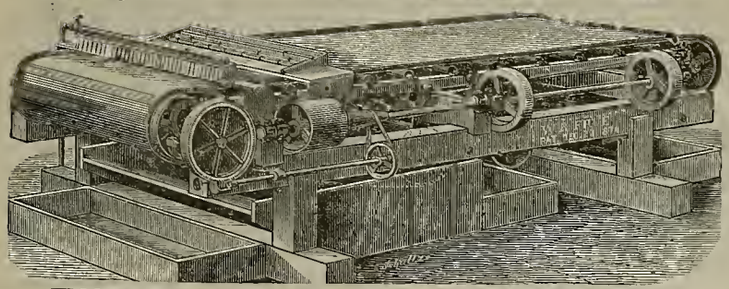

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Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.

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OUR U. S. AND FOREIGN PATENT AGENCY presents many and important advantages as a Home Agency over all others, by reason of long establishment, great experience, thorough system, intimate acquaintance with the subjects of inventions in our own community, and our most extensive law and reference library containing official American and foreign reports, files of scientific and mechanical publications, etc. All worthy inventions patented through our Agency will have the benefit of an illustration or a description in the MINING AND SCIENTIFIC PRESS. We transact every branch of Patent business, and obtain Patents in all countries which grant protection to inventors. The large majority of U. S. and Foreign Patents issued to inventors on the Pacific Coast have been obtained through our Agency. We can give the best and most *reliable* advice as to the patentability of new inventions. Our prices are as low as any first-class agencies in the Eastern States, while our advantages for Pacific Coast inventors are far superior. Advice and Circulars free. DEWEY & CO., PATENT AGENTS.

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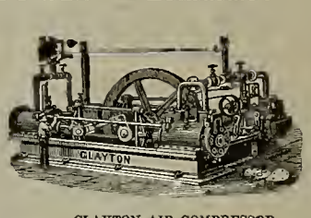

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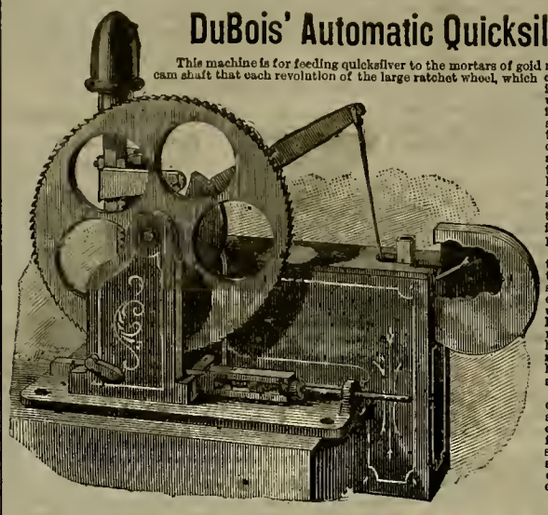
This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.
The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.
A chief point of excellence of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; *i. e.*, from every one to four minutes.
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IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt. Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.

Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver ores Chloridizing Furnaces, Retorts, Rock Drills Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill supplies. Iron Work complete for Wood Frames, also
SPERRY'S WROUGHT IRON FRAME FOR STAMP MILLS.
☞Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
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Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
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FROM 1-4 TO 10,000 lbs. WEIGHT.
True to pattern, sound and solid, of unequaled strength, toughness and durability.
An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
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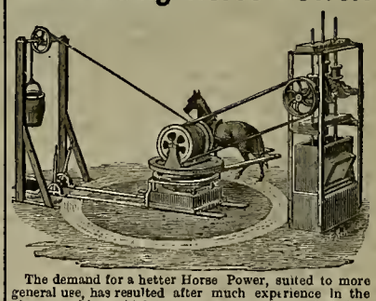
New Mining Horse Power.

The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
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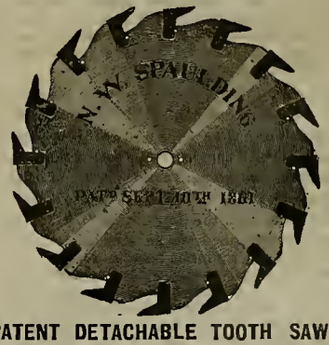

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Palmer's Safety Clutch
FOR
ELEVATORS
Will be Applied to Elevators on Short Notice.
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING MARCH 7, 1882.

254 762—ELECTRIC LAMP REGULATOR—Brewer & Waterhouse, Sacramento, Cal.

254,532 - CUTTER AND PUNCH ATTACHMENT FOR ANVILS—Geo. T. Childs, Lookout, Cal.

254,473—ROPE CLAMP—John Gates, Portland, Or.

254,552—DRAFT ADJUSTING DEVICE FOR HARNESS—Jas. Hugill, Woodbridge, Cal.

254,687—BUSHING FOR BARRELS—Thos. J. Loftus, Sacramento, Cal.

254,675—AMALGAMATOR—A. McKellar, Washington Ter.

254,760—BAN MATTRESS—J. N. Young, Sacramento, Cal.

FOR THE WEEK ENDING MARCH 14, 1882.

254,908—CAR TRUCK—A. A., E. & H. Blackman, Snohomish, W. T.

254,861—TOOL HANDLE—Thos. Bolton, S. F.

254,805- QUARTZ MILL—Jas. Day, S. F.

254 878—TAAIN BOATS—Wm. J. Little, Stockton, Cal.

254,996—HUB—A. McKellar, Fort Douglas, Utah.

254,885 —TAUCA AND DAAALOA—Alex. Rohinson, Benicia, Cal.

255,031.—TELEPHONE EXCHANGE CIRCUIT AND APPARATUS—John I. Sabin, S. F.

254,892.—WELL BORING APPARATUS—Frank Whelan, S. F., Cal.

254,858.—GRAIN SEPARATOR—David Young, Stockton, Cal.

254,815.—LIFTING JACK—Chas. Gracey, Contention, A. T.

255,052.—SAFETY LAMP—Tingry & Siffait, Portland, Oregon.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are wortby of special mention:

DRAFT-ADJUSTING DEVICE FOR HARNESS.—James Hugill, Woodbridge, San Joaqnin county. This invention relates to an improved draft-adjnsting device for barness, and it consists of a metallic end, into which the tugs or draft straps are fixed, and which has a spring-actuating sliding block near its front end. Through a hole in the front of the end piece, or box which is attached to the tng, a bar passes vertically and has its ends bent at right angles, so as to be secured to one side of the hames, which fits upon the collar. The bar is notched upon its front side, and the spring-block pressing against its rear side forces tho notches against corresponding projections on the front of the box, so as to hold the bar at any desired point. By pressing the bar back, so as to release the notches, the tug may be moved np or down, and will thus change the draft to snit.

TRAIN BOAT.—Wm. J. Little, Stockton. No. 254,878. Dated March 14, 1882. The object of this invention is to provide a boat capable of navigating shallow waters. In low rivers in which the channel is tortuous it is impossible to use a single long boat, because it cannot follow the turns of the stream. It is therefore necessary to obtain the requisite length, while still making provision for the windings of the stream. For this purpose a train of short boats is made, each one being capable of turning independently, thus causing the whole line to adapt itself to the windings of the channel. The invention consists in providing supplemental rudders pivoted to each side of the rear ends of the boat sections, so that said rudders oover the space intervening between the sections of the boat and prevent a rush of water in between them when the train boat is in motion. The snpplemental rudders also aid the main rudder in eteering when reqnired.

WELL-BORING APPARATUS.—Frank Whelan, S. F. Dated March 14, 1882. No. 254,892. This invention, relating to well-boring apparatus, consists of a supplemental tool holder, so constructed and arranged as to operate in connection with a rod, or series of jointed rods, which extend from the top to the bottom of the tube or well, the lower joint or length being made square, or so formed as to receive and steady the clasps or guides from a short supplemental tool holder, which slips down on one side of the main rod, and a wire, or other flexible connection, from its upper end, by which it may be suspended or drawn up with the tool, without disturbing or removing the main rod. The latch is operated by suitable connection, so as to be detached when it is desired to draw the tool up; and, by a peculiar device, the tool-holder is always turned so as to fit the shank in the proper position. This tool-holding device can be utilized either in drilling or boring of wells, or as a tool clamp or drill-rod grab.

CUTTER AND PUNCH ATTACHMENT FOR ANVILS.—Geo. T. Childs, Lookout, Inyo county, Cal. This invention relates to that class of anvils designed to hold cutters or punches to be operated upon by the smith's hammer, wherein a bracket having a hollow head is provided with a tool-holding shank, to which is seonred a cross-head, and beneath which are coil springs. The object of the invention is to provide a means for readily removing the tool-holding shank from the head of the bracket, and it oonsists in a braoket provided with a hollow head for the reception of a tool-bolding shank, cross-head and springs, combined with a removable securing plate, whereby the tool-holding shank can he removed and replaced with facility.

COMBINED TRUCK AND DERRICK.—Alexander Robinson, Benicia. No. 254,885. Dated March 14, 1882. This invention relates to a combined truck and derrick, the object of which is to combine in one device both the lifting and carrying capacity, for convenience in removing weights and heavy bodies of all kinds. It consists in the employment of two separate trucks connected by the derrick timbers, which, by being binged at the top, adapt the truck to separate or approach. This is accomplished by appropriate pulleys or oords. The trucks are separated on each side of a weight, and, by their approach, lift the weight between them and up on to their tops.

TOOL HANDLE.—Thos. Bolton, S. F. No. 254,861. Dated March 14, 1882. This invention relates to the attachment of small metallic tools and instruments to a holder or stock. The holder has a peculiarly-placed notch formed across it and the tool has a curved and flattened elastic tang to fit into this socket, the tool being thus held in place.

News in Brief.

Two colonies, says the Helena, M. T., *Independent*, one from Salt Lake and the other from Oregon, will settle at the head of Flathead lake, M. T.

THE Garfield Monument Committee has collected $106,000, of which $70,000 was given by the city of Cleveland. The sum of $250,000 altogether is wanted.

THE Los Angeles *Times* quotes the opinion of "a good judge of the value of things," to the effect that lands have advanced 25% since the recent heavy rains.

THE town of Truckee is so buried in snow that the smaller buildings are ont of sight, and a person can walk from the street directly over the roofs of most of them.

THE Tucson, A. T., *Star* says that during the late snow storm, while the S. P. R. R. Co. was building its road through Paisano pass, 30 horses died of pneumonia.

JAS. H. GAGER, an old pioneer, and for some years past Confidential Secretary for James C. Flood, died last week. He was the first Secretary of the S. F. Stock Board.

NEVADA stock men predict that the coming spring will be an excellent one for grass. The ground is well soaked with water. There is plenty of snow in the mountains.

M. E. DICKSON, of Chicago, has started for Washington with a petition for the pardon of Sergeant Mason. The petition is 2,400 ft. long, and is said to contain 120,000 names.

BRADLAUGH has been urgently pressed by a committee of free thinkers to accept the Presidency of the International Congress which is proposed to be held at Rome next autumn.

THE Chico *Record* says the coming season bids fair to be the liveliest one the lumber region in that county has ever witnessed. Preparations will shortly be made for starting up in all the camps.

NOTWITHSTANDING Vacaville is one of the greatest fruit-shipping points in the State, there has been a greater number of new orchards and vineyards planted this season than all the old ones put together.

WARRANTS were issued for 600 violators of the Sunday law in San Francisco on Monday. This included saloon keepers, cigar dealers, grocerymen, news dealers and people in many other branches of business.

HERR RULF, of Merveil, Prussia, writes the *Jewish World*, saying that the decision of the St. Petersburg Commission on the Jewish question may have the immediate effect of depriving a million people of their homes.

Pleasure in Recommending, Etc.

CARDALE, Stanislaus Co., Cal., March 6, 1882.

Messrs. Dewey & Co.—DEAR SIRS:—I hereby acknowledge receipt of patent with copies, for which please accept my sincere thanks. I shall take pleasure in recommending your agency when I have an opportunity.

Yours Truly, J. M. NELSON.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
B. W. CROWELL, San Benito and Monterey counties.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARMN C. HOAG—California.

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Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F. D., at this office.

Cylinder Printing Press for Sale.

A large cylinder Hoe printing press, for country newspaper work, can be bought cheap by addressing

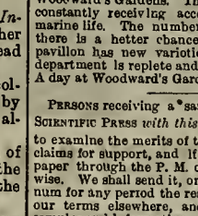
Press, Box 2361, S. F.

Business Offices and Sunny Rooms to Let.

We have some desirable rooms to let adjoining the offices of this paper which will be rented on favorable terms. Stair entrance, No. 252 Market St. Elevator, No. 12 Front St. Parties wishing offices, etc., will do well to call and see them. DEWEY & CO.

Canvassing Agents.

We want several canvassing agents who will make it their business to solicit subscriptions and advertising for our first-class progressive newspapers. Men of ability and experience can secure good pay and permanent employment. Send references and state your past occupation, etc., to the publishers of this paper.



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THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

San Francisco Metal Market.

[WHOLESALE.
THURSDAY, March 2, 1881.

IRON.—	
American, Pig, soft, ton	—@35 00
Scotch, Pig, ton	25 50 @27 50
American White Pig, ton	— @— —
Oregon Pig, ton	— @33 00
Clipper Gap, No. 1	— @32 00
Clipper Cap, White	— @34 00
Clipper Gan Car Wheel	— @35 00
Refined Bar	4 @—
Horse Shoes, keg	— @ 5 50
Nail Rod	— @ 7½
Norway, according to thickness	6½@ 70
STEEL.—	
English Cast, lb	13 @ 15
Black Diamond, ordinary sizes	13 @ 16
Drill	15 @ 16
Flat Bar	16 @ 18
COPPER.—	
Ingot	— @ 22
Sheet	— @ 30
Sheating, Timed 14x18	— @ 31
Nails	— @ 17
Bolts	— @ 33
Old	— @ —
Bar	— @ 22
Cement, 100 fine	— @ 15½
LEAD.—	
Pig	— @ 5
Bar	— @ 6
Pipe	— @ 8
Sheet	— @ 9
Shot, discount 10% on 500 Bags	
Drop, per bag	— @ 2 10
Buck, "	— @ 2 30
Chilled "	— @ 2 50
TIN PLATES.—	
10x14 I C Charcoal	7 00 @ 8 00
10x14 I C Coke	6 25 @ 6 50
Banca Tin	— @22 50
Australian	— @23 50
I. C. Charcoal Roofing 14x20	— @ 6 90
ZINC.—	
By the Cask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @ 10
NAILS.—	
Assorted Sizes	4 00 @ 4 15
QUICKSILVER.—	
By the flask	@36½ 38½
Flasks, new	— @ 1 25
Flasks, old	— @ 1 05

Retail Groceries, Etc.

WEDNESDAY M. March 22, 1882.

Butter, California			Rice	8	@ 10
Choice, lb	45	@ 65	Yeast Powdr, doz	1 50	@2 00
Cheese	17	@ 25	Can Oysters, doz	2 00	@3 00
Eastern	25	@ 30	Syrup, S F & old'n	75	@1 10
Lard, Cal		@ 18	Dried Apples, lb	10	@ 15
Eastern	20	@ 25	Ger. Prunes	12½	@ 20
Flour, ex. fm, bbl	8 00	@9 00	Figs, Cal	9	@ 10
Corn Meal, lb	2½	@ 3	Peaches	15	@ 25
Sugar, wh. crashd	12½	@ 13½	Oils, Kerosene	50	@ 60
Light Brown	8	@ 9½	Wines, Old Port	3 50	@5 50
Coffee, Green	23	@ 35	French Claret	1 00	@2 50
Tea, fine Black	50	@1 00	Cal. doz bot	2 00	@4 50
Finest Japan	55	@1 00	Whisky, C K, gal	3 50	@5 00
Candles, Adm'te	15	@ 25	French Brandy	4 00	@8 00
Soap, Cal	7	@ 10			

General Merchandise.

WHOLESALE.

WEDNESDAY M., March 22, 1882.

CANDLES.		Cement, Rosendale	1 75 @ 2 00
Crystal Wax	16 @18	Portland	3 75 @ 4 00
Paraffine	20 @—	**NAILS.**	
Patent Sperm	25 —28	Assrtd sizes, keg	3 75 @ 4 00
CANNED GOODS.		**OILS.**	
Assrtd Ple Fruits.		Pacific Glue Co's	
2½ lb cans	2 25	Neatsfoot, No. 1	1 00 @1 00
Table do	3 50 @ —	Castor, No. 1	— @1 05
Jams and Jellies	3 75 @ —	do, No. 2	— @ 95
Pickles, bf gal	3 25 @ —	Baker's A A	— @1 30
Sardines, qr box	1 67 @ —	Olive, Flagnoli	1 25 @3 75
Hf Boxes	2 50½@1 90	Possel	4 75 @5 25
Merry, Faull & Co.s		Palm, lb	9 @ —
Preserved Beef		Linseed, Raw, bbl	— @ 50
2lb, doz	3 25 @3 —	Boiled	— @ 65
do 4 lb doz	6 50 @6 —	Cocoanut	50 @ —
Preserved Mutton		China nut, cs	68 @ 69
2 lb, doz	3 25 @3 50	Sperm	1 40 @ —
Beef Tongue	5 75 @6 00	Coast Whales	35 @ —
Preserved Ham,		Polar	— @ —
2 lb, doz	5 50 @5 60	Lard	— @1 00
Devilled Ham, 1 lb,		Petroleum (110°)	18 @ 22
doz	3 00 @3 50	Petroleum (150°)	28 @ 35
do Ham ½ lb doz	2 50 @ —	**PAINTS.**	
Boneless Pigs Feet		Pure White Lead	7½@ 8
3lbs	3 50 @3 75	Whiting	1½@ —
2 lbs	2 75 @ —	Putty	4 @ 5
Spiced Fillets 2 lbs	3 50 @ —	Chalk	1½@ —
Head Cheese 3 lbs	3 50 @ —	Paris White	2½@ —
COAL—Jobbing.		Ochre	3½@ —
Australian, ton	— @ 8 50	Venetian Red	3½@ —
Coos Bay	6 50 @ 7 50	Averil mixd Paint	
Bellingham Bay	— @ —	gal	
Seattle	7 00 @ —	White & Tints	2 00 @2 00
Cumberland	— @13 00	Green, Blue and	
Mt Diablo	— @ —	Ch Yellow	3 00 @3 50
Lehigh	— @ —	Light Red	3 00 @3 50
Liverpool	— @ —	Metallic Roof	1 30 @1 60
West Hartley	— @ 9 00	**RICE.**	
Scotch	— @ 8 50	China Mixed, lb	4½@ 5
Scranton	— @ —	Hawaiian	4½@ 5
Vancouver Id	— @ —	**SALT.**	
Wellington	— @ 9 00	Cal. Bay, ton	14 00 @22 00
Charcoal, sack	— @ —	Common	8 50 @14 00
Coke, bush	— @ —	Carmen Id	14 00 @22 00
COFFEE.		Liverpool fine	14 00 @20 00
Sandwich Id lb	— @ —	**SOAP.**	
Costa Rica	12 @ 14	Castile, lb	9 @ 10
Guatemala	12 @ 14	Common hrands	4½@ 8
Java	18 @ 20	Fancy Brands	7 @ 8
Manilla	15 @ —	**SPICES.**	
Ground, in cs	— @ 22½	Cloves, lb	37½@ 40
FISH.		Cassia	19 @ 20
Sac'to Dry Cod	— @ — 5	Nutmegs	85 @ 90
do in cases	— @ — 5½	Pepper Grain	15 @ 16
Eastern Cod	7 @ — 7½	Pimento	16 @ 17
Salmon, hbls	7 00 @ 7 50	Mustard, Cal ½ lb	
Hf bbls	3 50 @ 4 00	Glass	— @1 25
1 lb cans	1 12½@ 1 22½	**SUGAR, ETC.**	
Pkld Cod, hbls	— @ —	Cal. Cube lb	— @ 11½
Hf bbls	— @ —	Powdered	— @ 12
Mackerel, No. 1		Fine Crushed	— @ 11½
Hf bbls	9 50 @ 10 00	Granulated	— @ 10½
In Kits	1 75 @ 1 85	Golden C	— @ 9½
Ex Mess	3 50 @ 4 00	Cal Syrup, kgs	65 @ —
Pickled Herring, box	3 00 @ 3 50	Hawaiian Mol'sses	25 @ 30
Boston Smoked Herring	65 @ — 70	**TEA.**	
LIME, etc.		Young Hyson, Moyune, etc	40 @ 65
Plaster, Golden Cate Mills	3 00 @ 3 25	Country pkd Gunpowder & Imperial	35 @ 75
Land Plaster, ton	10 00 @ 12 50	Hyson	30 @ 35½
Lime, Santa Cruz hhl	1 25 @ 1 50	Fooo-Chow C	27½@ 32
		Japan, medium	35 @ 37½

Pacific Coast Weather for the Week.

[Furnished for publication in the PRESS by NELSON GEROM, Sergt. Signal Service Corps, U. S. A.]

The following is a summary of the rainfall for each day of the week ending 11:58 A.M. Wednesday, March 22d, at noon, for the stations named:

	Olympia.	Portland.	Roseburg.	Red Bluff	Sacram'to	San Francisco	Visalia.	Los Angeles.	San Diego
Thursday.	.00	.—	.09	.19	.60	.06	.28	.63	.08
Friday	.29	.16	.25	.02	.03	.03	.09	.03	.10
Saturday	.32	.56	.92	.09	.17	*.14	.00	.00	.00
Sunday	.12	.00	.15	.02	.20	.08	.17	.05	.00
Monday	.01	.05	—	.00	.00	.00	.00	.00	.00
Tuesday	.01	.00	.00	.00	.00	.00	.00	.00	.00
Wed'sday.	.11	.04	.00	.00	.00	.00	.00	.00	.00
Totals	.90	.90	1.41	.32	1.00	.31	.54	.76	0.18

Leather.

[WHOLESALE.]

WEDNESDAY, M, March 22, 1882.

Sole Leather, heavy, lb	30 @ 32
Light	25 @ 28
Jodot, 8 to 10 Kil., doz	36 00 @48 00
11 to 13 Kil	50 00 @60 00
14 to 16 Kil	65 00 @72 00
Second Choice, 11 to 16 Kil	40 00 @65 00
Simon Ulmo, Females, 12 to 13 Kil	52 00 @56 00
14 to 15 Kil	60 00 @64 00
16 to 17 Kil	66 00 @68 00
Simon, 18 Kil	— @57 00
20 Kil	— @60 00
24 Kil	— @65 00
Kips, French, lb	85 @ 1 20
Calf, doz	55 00 @60 00
French Sheep, all colors	12 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @10 00
For linings	6 50 @10 00
Cal. Russet Sheep Linings	3 00 @ 5 50
Boot Legs, French Calf, pair	— @ 4 50
Good French Calf	— @ 4 00
Best Jodot Calf	4 75 @ 5 00
Leather, Harness, lb	35 @ 40
Fair Bridle, doz	45 00 @66 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @36 00
Buff, ft	17 @ 20
Wax Side	19 @ 20

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending March 21, 1882.

HIGHEST AND LOWEST BAROMETER.

Mar. 15	Mar. 16	Mar. 17	Mar. 18	Mar. 19	Mar. 20	Mar. 21
29.839	30.007	30.154	30.120	30.300	30.378	30 331
29.751	29.839	30.007	29.938	29.968	30.300	30.252

MAXIMUM AND MINIMUM THERMOMETER.

53	54.5	54	56.5	49	54.5	63
45.5	44.5	44	46	42	41	44

MEAN DAILY HUMIDITY.

74	71.7	72.7	75.7	63.7	57	85.7

PREVAILING WIND.

SE	SW	SW	SW	W	'N	N

WIND—MILES TRAVELED.

325	178	181	303	241	183	185

STATE OF WEATHER.

Fair.	Fair.	Fair.	Fair.	Fair.	Clear.	Clear.

RAINFALL IN TWENTY-FOUR HOURS.

.63	.06	.—	.18	.04		

Total rain during the season, from July 1, 1881, 14.67 inches.

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OFFICE OF THE

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At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 27), of Twenty-five Cents (25c) per share was declared, payable Wednesday, March 15th, 1882, at the office of the Company, room 19, No. 328 Montgomery Street, San Francisco, Cal. Transfer books will be closed on March 11, 1882, at 1 P. M.

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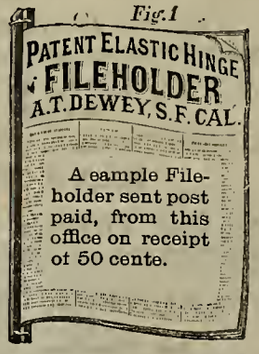
Fig. 1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Builders of Steam Machinery
IN ALL ITS BRANCHES,
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STEAM VESSELS, of all kinds, built complete with Hulls of Wood, Iron or Composite.
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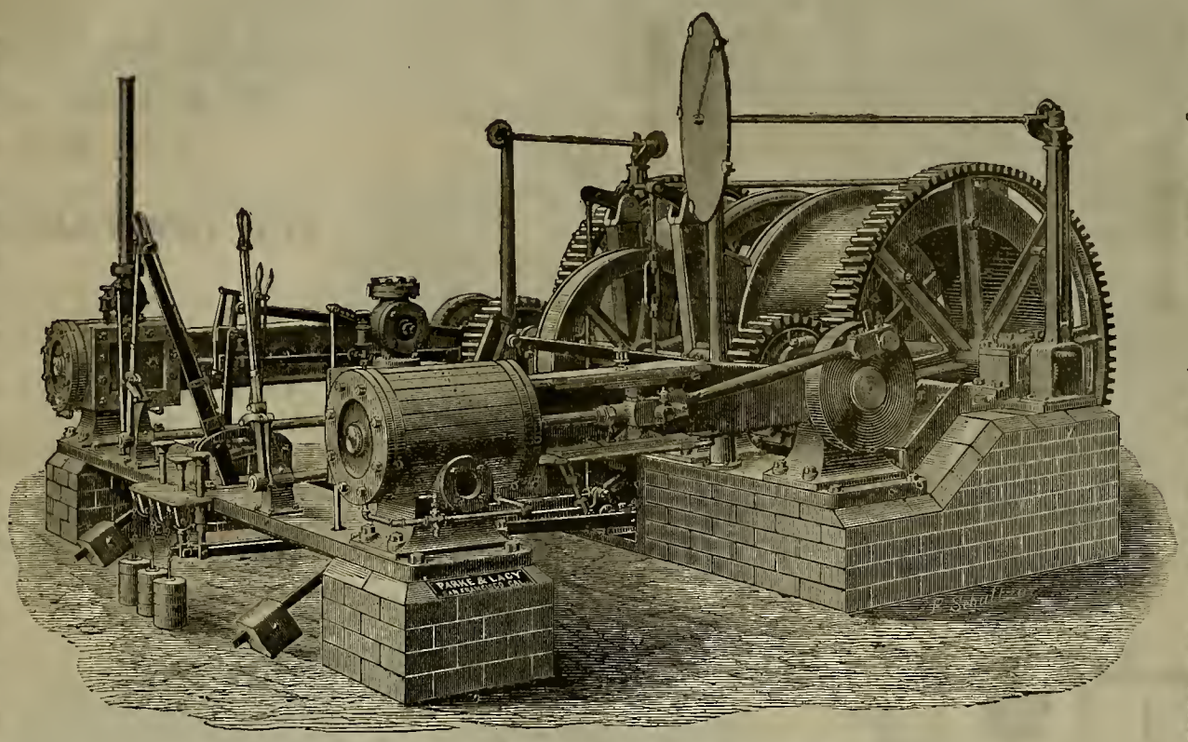

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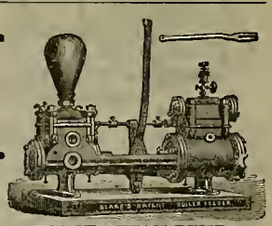

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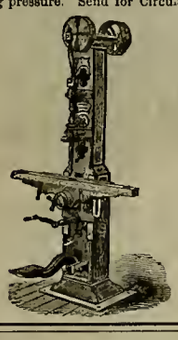

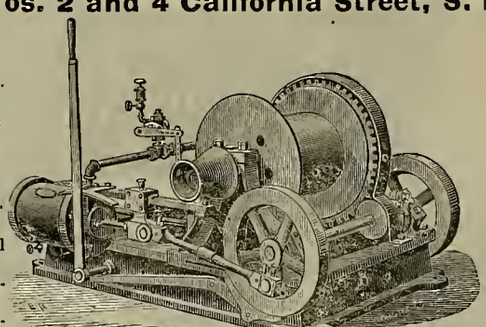

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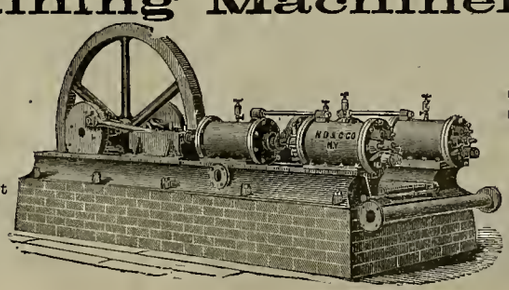

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Ore and Water
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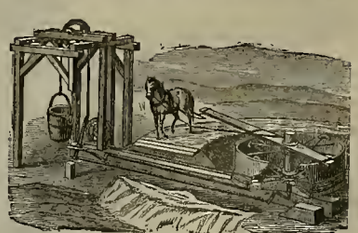

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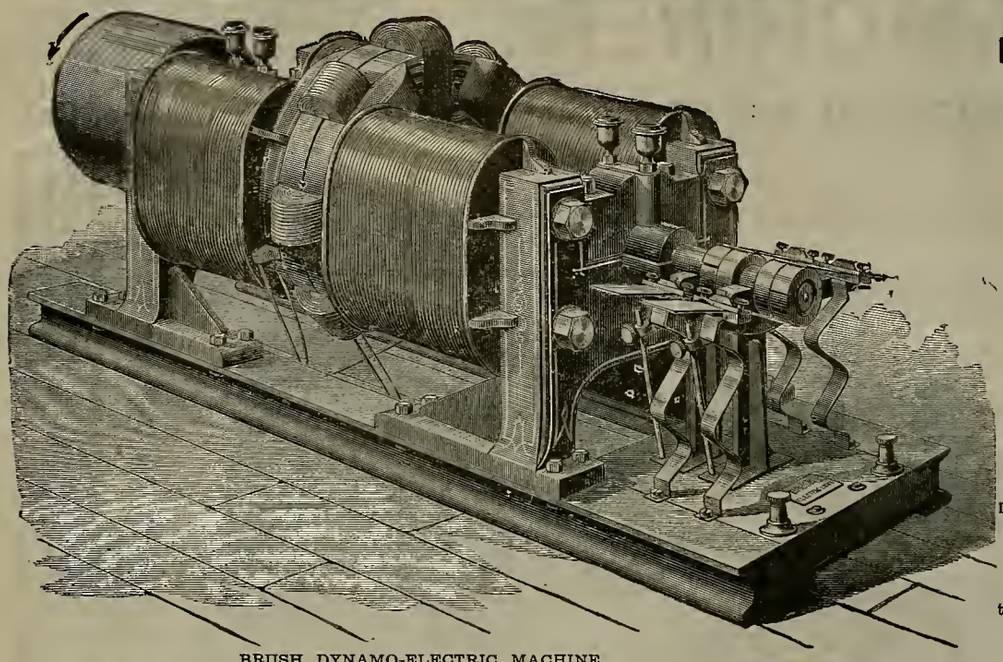

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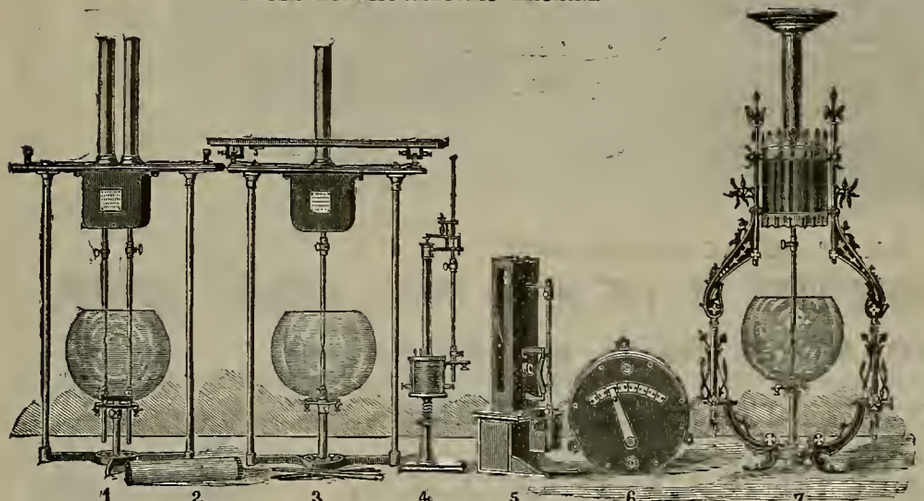

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SEND for CIRCULARS.

Mining Cages,
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ALSO,

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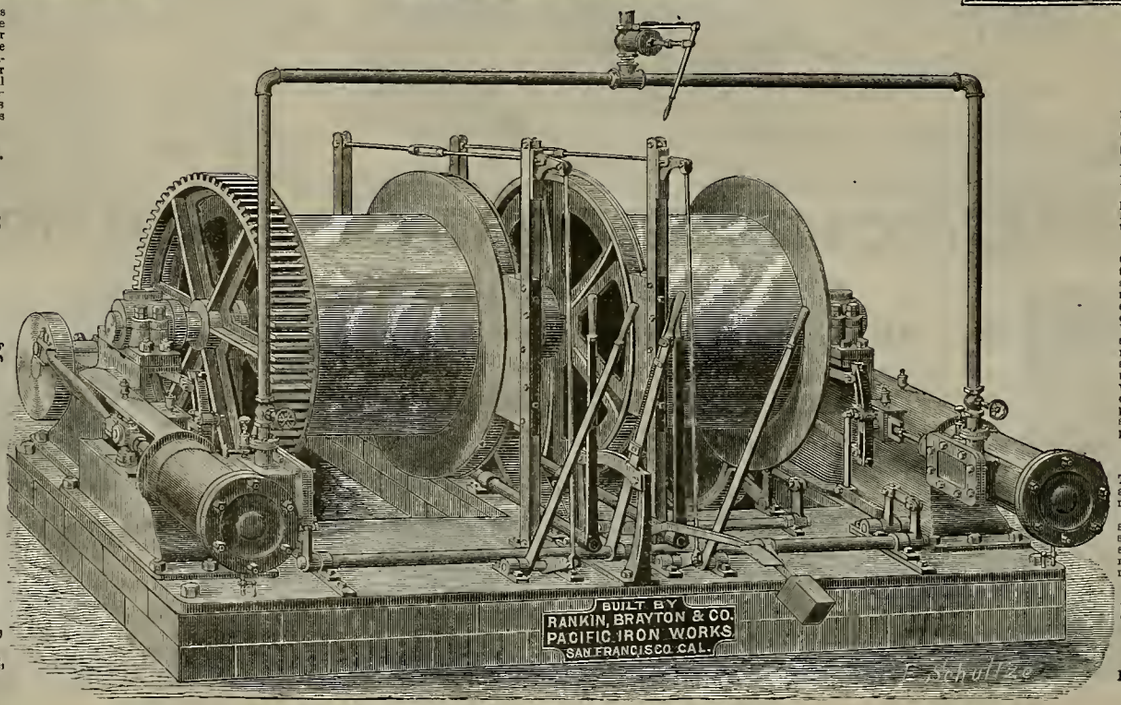

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Which are covered by Letters Patent.

No other furnaces can compare with these for DURABILITY and in capacity for uninterrupted work.

More than Sixty

Of them are now running on the Pacific Coast, giving results never before obtained as regards continuous running, economy of fuel, grade and quality of bullion produced. We are prepared to demonstrate by facts the claims here made. These Smelters are shipped in a complete state, requiring no brick or stone work, except that for the crucible, thus saving great expense and loss of time in construction. Complete smelting plants made to order of any capacity and with al

THE IMPROVEMENTS

That experience has suggested as valuable in this class of machinery.

Skilled and experienced smelters furnished when desired to examine mines and to superintend construction and running of furnaces. Estimates given upon application. Send for circular.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, APRIL 1, 1882.

VOLUME XLIV Number 13.

Mammoths.

Giant Forms of Extinct Animal Life.

Mammoth remains are among the very earliest forms of extinct animal life which attracted the attention of observers of our earth and its natural products. Theophrastus, 312 years before Christ, first recorded elephant bones as being dug from the earth in Greece, and 400 years later Pliny noticed the same fact in Italy. Both of these naturalists, penetrated by the spirit of their times, considered them as *lusus naturæ*, formed in the soil where they occurred by some plastic force of nature, and never having really been parts of living creatures.

Later on—in the 17th century—mammoth bones were found in many parts of central Europe and Italy and discussed by the philosophers of the time, who usually recognized their elephantine character, but accounted for their origin by referring them to the Noachian deluge or, in some districts, to the elephants brought by Hannibal from Africa in his invasion of the Roman Empire. A few still adhered to the *lusus naturæ* theory. Thus, in 1696, the skeleton of a mammoth was dug up at Tonna, near Gotha, in Germany, and was described by William Ernest Tentzel, a teacher in the Gotha gymnasium. He declared the bones to be the remains of an animal that had lived long before. The medical faculty, in Gotha, however, examined carefully these actual bones—saw their condyles, articular surfaces, trochanters and nerve foramina—and then decided officially that this specimen was only a freak of nature, an imitation by mineral matter working beneath the earth, of an organized creature which once roamed on the surface.

It remained for the great Cuvier to dispel this darkness and uncertainty and to throw the light of scientific study and intelligent induction upon the question of the

Nature of these Fossils.

In January, 1796, he announced to the French Institute that his examinations had shown him that these were the remains of fossil elephants, and that they were, furthermore, of species different from any now living on the globe. He says: "This idea has opened to me views entirely new concerning the theory of the earth." From that time the study of the mammoth and of its congener, the mastodon, went on upon a sound basis, and discoveries were made in great numbers and from all directions. It was soon found that the whole continent of Europe, from France and England to the Ural mountains, and from Sicily to northern Russia, was thickly strewn with mammoth bones in its alluvial and post-pliocene deposits, while those of the mastodon occurred in the pliocene proper and in the island of Malta in the miocene. Further research showed the mammoth in India, Persia, Siam, all northern Siberia, China and Japan. In both the continents of Europe and of Asia, these remains were found to be more sparsely distributed in the southern lands, and to abound in vast numbers on the northern limit, showing thus a strange disagreement in distribution with the elephant of the present day, which is confined, in its wild state, to the tropical portions of Africa and to the equally hot countries of India, Sumatra and Borneo. All the northern shore of Siberia, particularly in the deltas of the Lena and the Yenessei and in the islands lying off their coast, is crowded thick with the leg-bones, tusks and molar teeth of these extinct mammoths. In some places the combined action of sea waves and river freshets have piled these bones together in quantities so vast that their number and volume is something almost incredible. This is particularly the case at the Loichovian isles, north of the mouth of the river Seva. The tusks are here so numerous, and are in a state of such excellent preservation, that they form an important article of commerce, and are annually shipped in large quantities to Russia and to England, there to be employed by the ivory turner in the same works as is the living ivory of Asia and Africa. The preservation in Siberia of these countless large bones has long been a wonder to the inhabitants of these countries who had no reasonable explanation of their source or origin. With an absurd credulity they attributed them to a gigantic mole, which, they thought, burrowed in the ground, living on roots, and only appearing at the surface during the darkest nights. To this creature they gave

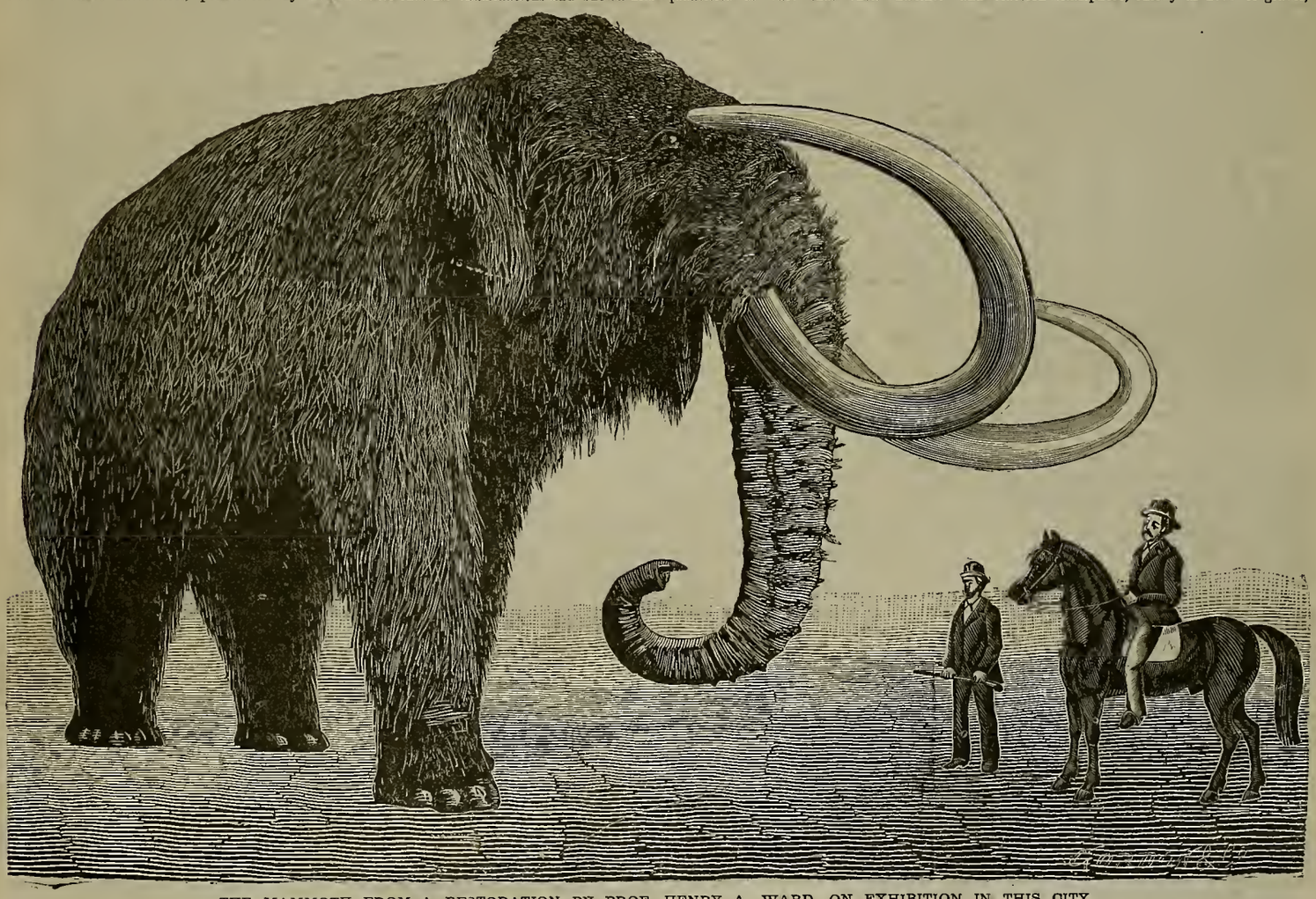
The Name of Mammoth,

Which, in their language, is a name applied to any burrowing animal. This name has been universally accepted in Europe, but limited to the species studied by Cuvier and described by his friend Blumenbach as *Elephas primigenius*. Bones of this species abound in nearly every part of Europe, although as we have just noticed, the strange fact exists that they become less and less abundant as we approach southern lands—the present home of the race. In short, the Mammoth was once an inhabitant of north temperate and frigid zones; now its descendants, reduced in numbers and degenerate in size, inhabit the tropics. Its remains occur in the Eastern hemisphere, chiefly in beds of gravel, clay and other material of post-pliocene age. In the extreme north they have still a further *situs*.

More than a Hundred Years Ago,

Not only their ivory but their carcasses were known to exist in Siberia, imbedded in solid ice. The first discovery was on the border of the Alaseia river, which flows into the Arctic ocean, in lat. 72°, or 6° north of the Arctic circle. The body, largely imbedded in ice, was still standing erect, and was almost perfect. The skin remained in place, and the hair and fur were still attached in spots. In 1772 the body of a perfect two-horned rhinoceros, covered with hair, was found preserved in frozen gravel near the Wiljui, a tributary of the Lena, in lat. 64°. The head and feet of this animal were brought to St. Petersburg; but as they had been largely divested of their skin covering, the report of their excellent preservation, as of that of the first-

(CONTINUED ON PAGE 217.)



THE MAMMOTH—FROM A RESTORATION BY PROF. HENRY A. WARD, ON EXHIBITION IN THIS CITY.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Iowa Hill District.

Drift and Quartz Mines.

Editors Press:—The cold and snow have prevented us from getting much water so far for hydraulic purposes, and, consequently, many of us miners are out of employment. So youre truly concluded to send you a few lines regarding what is and has been done in our drift and quartz mines. To commence at the old

Mountain Gate Mine.

They have for some time been making preparations to put in a Liffell turbine wheel, which was made especially for the company, it being 8⅝ inches in diameter, and to work under 40 ft. head; supply pipe, 15 inches. Their old wheel was not put in by men of experience. It was almost impossible to get a millwright in the mine 6,000 ft. from the mouth of the tunnel—damp and poor light, etc. The company, too, had been prospecting so long, they could not afford to pay extra wages, and they undertook to put in their machinery with what ability they had within the company. The result was, to use the expression of an old member of the company: "It cost enough to be silver-plated all over." The new wheel was missent, and did not get to the mine until the snow set in, and it has been found impossible to get it delivered to date, as there is from 3 to 4 ft. of snow on the ridge. As soon as they get a good hoisting and pumping rig in, they expect to take out pay in the old-time style; though it always seemed to your correspondent that there was more to do then there was brains to do it, considering the amount of perverse humanity a manager had to contend with in the shape of shareholders, who did not know much about anything.

On Humbug Canyon,

Some half-mile west of the Mountain Gate mine, very fine quartz has been found in what was formerly known as the Pioneer quartz company's claim. This consists of different locations consolidated, for which they hold United States patent. It was found difficult to get supplies in through the winter, and work was suspended on the coming of the first winter storms. A large quantity of rock has been crushed from this mine. Several years ago, some of their tunnels on the east were run, when black powder was as high as $20 per keg. The claim is 6,000 feet long, and is held in ten shares. I understand they intend to continue their developments as soon as winter is over. Lower down on this canyon is the

Poole Quartz Mine.

On which was put a five-stamp mill. Their ledge got broken up in the face of the tunnel late in the fall. It was followed below the grade, and found to pay about $25 per ton. Not having time to make any arrangements for drainage, they also suspended operations for the winter. Some think this is an extension of the Pioneer-Union ledge, as the first-mentioned ledge is now called. Both of these ledges average thirty inches in width. There has been much prospecting done in the vicinity of these ledges, with varying results. Quartz is very plenty in that vicinity. The country rock is slate, and hills steep, consequently all prospecting can be done by tunnel, which can be run from $4 to $6 per foot, and is considered by many to be a favorable place to find gold-bearing quartz. As we travel

Down the Divide

To the right or "North Fork" side, we come to the Colfax Co.'s tunnel, which has been run some 1,100 ft. across a flat toward the main hill. It passes through some very similar gravel to that being worked in the Mountain Gate mine; nor could I understand why the Colfax Co. did not extract some of this same gravel.

A little further down the ridge to the left is the West Damascus Co.'s hoisting and pumping works, which have been shut down, pending the settlement of the estate of the principal owner, who died some time since. His death was quite a loss to this community. He had means, and the courage to use them. Had he lived, it is conceded many developments would have been made. The great want here is capital, judiciously expended. This mine was opened by a shaft, as it is located in a flat head of the north branch of Short Tail canyon, expecting to find a continuation of the pay channel, which the Mt. Gate Co. have. So far they have not been successful. Again, on the "North Fork" side, adjoining the Colfax, is the Pioneer gravel. They have done some prospecting, but are all poor men and unable to push their tunnel ahead. The location is considered by many as a favorable one, and that it was the outlet from the main channel which made Green Valley and Haden Hill so rich. We next come to the

Giant Gap Claim,

So called, I presume, from the immense slide which appears to have been carried from the top of the ridge into the North Fork of the American, some 1,500 ft. below. This work is being done by capital from the "Hub." Tunnel in 1,500 ft. and incline raised some 130 ft. Favorable looking gravel was found, though many think the course of the tunnel was not the correct one; that pay was passed to the north or left hand side. They are making connection with some old workings for air after which they will run for the main channel. Much energy has been displayed in this claim. It is the general wish that their efforts may be successful as, should a good mine be opened, it will be a strong inducement to other capitalists. There are several

Other Locations in this Vicinity.

But very little work has been done on them. The Mohawk company, about a mile down the "Ridge," an incline has been sunk 220 feet, as near as I can learn; but only one drift, some 80 feet in length, has been run from the bottom of the incline; work was then suspended, for reasons best known to those then in charge. Yet for the amount spent to get bottom, a single drift of that length into a hill one and a half to two miles wide, would seem like child's play. The next claim down-ridge to the left, or Short Tail canyon side, is on

Succor Flat.

This flat has been worked more or less since 1852. The two principal claims being worked now are the Copper Bottom and Succor Flat. The front was what is called "spotted." Occasionally a 4 to 6-ounce piece would be found, and again the gravel was poor. The latter company had extended their works to the foot of the hill, or back part of the flat, when they lost the rock. An incline was run some 30 feet, and good pay found. Though they could make fair wages, working up to their waists in water, they concluded it would not last long, and started a lower tunnel. This was about 1862, when no high explosives were in use, and very stiff rock was encountered. Assessments came in so frequent, many of the company moved off. The claim lay idle for several years, until another company undertook to relocate it. They, however, found a good chance for a lawsuit, and gave up. The old company then went to work with a will, and it is now being worked with good judgment, and considerable gold has been taken out in the last three years; one piece of gold taken out about 18 months ago coined $1,203. Several other large nuggets have been found. Everything connected with the mine has been put in with a view to permanency. About 25 men are employed. Horses are used to run the cars. In the tunnel very little water is encountered. The workings are 2,000 ft. from tunnel mouth, where they find the bedrock has commenced to pitch to the N. W. There are many other locations in this district which would make subject for another communication, if you think this worth inserting in your interesting paper.

Yours, etc., Miner.

Iowa Hill, Placer Co., Cal., March 20, 1882.

"Talk Up Your Camp!"

Ketchum, Idaho.

Editors Press:—As you request all who are in a mining camp to "talk it up," I will give you a few points that you can put in proper form for publication. As "Wood River" has generally been talked of away from here, particular locations, save a few, have been passed by. Of this locality, which is quite in the center of Wood River mining district, but very little outside has been said. It is located 20 miles up the river from the great Snake River valley, and 30 miles from the dividing summit of Wood River mountains on the northwest and the Salmon River valley, where the famous Sawtooth Mountain mines are. It is also at the confluence of Warm Spring stream and canyon and the well-known old Indian Trail Creek canyon. The town site is on a beautiful level bench of fine gravelly land, well adapted for the purpose, and is laid off in one plat a half mile square, and subdivided in blocks and lots. It is only a two-year-old town, and is quite thickly settled. The houses are quite neat and substantial.

The ores from East Fork, Elk Horn creek, Trail creek, Lake creek, Eagle creek, North Fork, Bowlder creek, Gresnhorn creek, Warm Spring canyon mines, and all its tributaries, as well as all the ores from the well-known Smoky Mountain mines at the head of Warm Springs canyon, have all got to come here for treatment or shipping.

At each of the above-named places are many locations, and to speak of one better than the other would be doing much injustice to the owner.

I have been here some six months, and to select one location as preferable for a mine I could not, as all locations have mineral. Some of them, at the commencement of shafting or working on the vein, have more than others; but which will hold out the longest, work and time only can tell.

The general formation I should call *rockite*, as it all looks like it to me, of one kind or the other, and the age is somewhere from the commencement of creation to the present time; and the definition given by Webster of argentiferous galena applies quite well to the ores on Wood River, containing an assay value of an average of 100 ounces silver, and 50% lead. I do not know of any amount of ore in place being valued less than 50 ounces silver and 50% lead, while some run into the thousands; and further in the rock, or ground, than has been dug no one has yet seen, consequently cannot truthfully tell what we have.

Over the mountains named, in the Sawtooth mountain mines, we find free-milling silver ore, of about the same average value end in large quantities. A large number of mines have been already located there.

What we are in want of now is men of capital and ability to come to this country to work the mines; we have a plenty of them, and good and safe enough for investment of any amount of capital in any judicious way, by mining, milling, or smelting, or all combined. The mines are favorably located for all of the above. Ore in abundance, water and wood to supply all wants and to spare, also iron ore and lime for fluxes.

Transportation by railroad to this place will be in order by next September, and, until that time, we have good stages, which make close time connections with U. P. R. R. at Black Fort, and C. P. R. R. at Kelton, and only 30 hours in doing it. Freighting by the "prairie schooners" is here done in a systematic way and on time, either fast or slow, as you want the rate to be, which, in any case, is not unreasonable.

Men of capital and energy, we appeal to you to give us a visit this summer, and prove to yourselves we are telling you the truth.

J. Miller.

Ketchum, Idaho, March 16.

Copper Mines in California.

Renewed attention was given to copper mining in California about seven years ago, by the discovery of some extensive outcroppings in Nevada county, which led to the organization of the San Francisco Copper Co., with a capital of 50,000 shares. The enterprise has, according to the *Bulletin*, been carefully and economically conducted, and although the property's improvements and running expenses have necessarily been large, amounting, perhaps, to $275,000, stockholders have not been called upon to pay in over $45,000, the remainder coming out of the earnings. The business has now reached a point where it is more than self-supporting, and the first dividend, at the rate of five cents per share, was declared on the 17th, and will be paid on the 20th. Seven years is a long time to wait for returns on capital, but the confidence of the promotere of this enterprise has been equal to the undertaking, and it is to be hoped that they will be abundantly rewarded for creating a new resource to this State.

The S. F. Copper Co. has a large quantity of low-grade copper ore. This is manufactured into copper cement. The process is slow, months being required in roasting and leaching, but the works are extensive, and the product of late has been about 40 tons copper cement per month. This cement is mostly shipped to the East by rail. It contains from 85% to 87½% pure copper, and selle about 2½ cents per lb. less than refined bars. It is used for the manufacture of blnestone, and for copper paint. No adequate attempt has been made by the company to manufacture pig copper. The ore carries a good deal of sulphur, which some day may be utilized in the manufacture of sulphuric acid. Our local manufacturers of this article now pay $30 per ton for Japan sulphur for this purpose. It is thought sulphur could be made from the ores at a cost of $18 or $20 per ton, after the erection of suitable works. The ore also carries considerable iron, which is claimed to be the best in the world for the manufacture of Bessemer steel. At present the iron and sulphur count for nothing in the business of the company.

There are some other copper mines in the State, but only one that is doing much. But it is believed that more deposits of copper ore exist here. Whether they will be developed very soon is another thing. Nothing can be successfully accomplished without smelting works for the manufacture of bar copper. If we had such an enterprise, there is no doubt it would be well supplied with ore, and would pay fair interest on the outlay. During the neglect of copper mining in this State, Arizona has come to the front as a producer of this metal on a large scale.—*Nevada Transcript.*

Father of Hydraulic Mining.

A telegram from Auburn, Placer county, says: "R. R. Craig, father of ex-Senator Joseph Craig and Lee D. Craig, of San Francisco, died Wednesday at the residence of E. L. Craig, in this place. Mr. Craig was the original inventor of the hydraulic process of mining and the Little Giant and Monitor machines."

There are some errors in the above, as the *Transcript* is prepared to establish by numerous witnesses. In April, 1852, C. H. Seymour, of this city, made for a Frenchman named Chabot, mining on Buckeye hill, near town, a hose four or five inches in diameter and between 35 and 40 ft. long to convey water into the claim. It had no nozzle, but, by pressing together the end, it was found to be very useful in washing the dirt picked down from the bank of gravel, and also in cleaning the bedrock. In 1853, E. E. Matteson and his partners, at Mr. Matteson's suggestion, attached a nozzle to a similar hose, and, by directing the stream against the bank of their mine at American Hill, found that a great saving of labor could be effected. That is the history of the origin of hydraulic mining in a nutshell, and the honors of the discovery and application really should be divided between Messrs. Chabot and Matteson.—*Nevada Transcript.*

Improved Telephonic Apparatus for Mines.

The transmitters in which more than one carbon contact is used have hitherto been, for the most part, made by attaching blocks of carbon to an elastic diaphragm, with connecting bars or rockers of carbon resting freely on and between these blocks, which bars are sensitive to the vibrations conveyed by the diaphragm. In these the diaphragm is a recipient of the sound waves. Mr. E. J. Paterson, of Finsbury, Park-road, proposes to dispense with the diaphragm and use several carbon blocks, of which one or more are fixed firmly to a base and electrically connected to one pole of a battery, while he supports the remainder elastically from a fixed base, connecting them with the other pole of the battery. Or in some cases he supports all the blocks elastically from a fixed base. These various blocks he connects with one another by means of carbon rockers, and the sound waves to be transmitted will impinge directly on the carbons without the intervention of a diaphragm. Thus, without disturbing their arrangement, *inter se*, the moving carbons will be vibrated, and, acting on a current passing through the instrument, will produce the so-called undulatory state necessary to the reproduction of similar and equal vibrations in a diaphragm at the receiving end with the assistance of electro-magnetic action.

Again, most carbon transmitters of this class are constructed with the diaphragm placed sloping; by this means there is a variation of incidence of the carbon rockers on their bearings, some pressing with more dead weight than others. The object of this is that, as the acoustic waves produced by articulate speech are complex, some being of less and some of greater amplitude, it is necessary to have the various channels through which the current passes proportioned to these various factors, and this is the case when some press heavily and some lightly on their bearings, the lighter rocking easily and others less easily. Mr. Paterson proposes to obtain this variation by using carbon rockers of different gauges, and therefore of different weights, and by this means he avoids the necessity for setting them on the incline, but can use them in either a horizontal or an upright position. This allows of economy and convenience in manufacture, and affords facilities in practical use. Various dispositions of the carbon blocks may be adopted; thus, for example, a simple and efficient arrangement is that in which one block is mounted elastically on end tension wires between two parallel fixed blocks, and these blocks are connected together by two sets of four rockers of varying gauge or diameter. Again, the middle block may be the center of a group of fixed blocks, and connected with them by rockers arranged radially around the elastically supported block, which block may either be carried by tension wires or supported by a central wire. From these examples it will be seen that the instrument is susceptible of various modifications in its arrangement, the principle of construction being nevertheless strictly maintained.

Mining vs. Stock Gambling.

There is considerable difference in mining in the mountains and in stock boards. The latter is generally carried on in New York and San Francisco; the former where the metal is found. Mining in stock boards is a risky business, and is one of the greatest evils honest mining has to contend against. There is no doubt but what most of the discredit excited against mining has its birth in the wild schemes carried through by these boards. The Chicago *Mining Review*, referring to these two kinds of mining, says:

"There appears to be a feeling on the part of a certain class of journals which live in the atmosphere of the stock boards, that when a break comes and the stock exchanges are dull and deserted, that the foundations of mining are threatened, and that the strong hands in mountain fastness and desert plain, wielding pick and drill, are paralyzed by the wild speculations of one party or the other in financial centers where the exchanges exist.

"Mining for precious and useful metals throughout the length and breadth of the land is unconscious of the mimic pandemonium which is daily witnessed, where it would seem that the mines were being tossed to and fro like fallen leaves in the autumn winds. The thundering crash of the stamp mill in the land, like the ponderous footsteps of a giant, crushing mountains beneath his mighty feet, and steady stream of bullion, like a molten river of treasure, flowing from the flumes and smelters from Maine to California, drowns the tiny conflicts of the exchanges as the rolling thunder and the hurricane of the tempest hush the twitter of the sparrow. They have but a faint conception of the grandeur and magnificence even of the mining industry of the present, which is only the seed-time and harvest compared to what it will be in the future, who fear that a few brokers, in any or every city, by shouting out the price of stock, with the names of mines attached, can wake the eternal slumber of the mountains reaching to heaven, and change one particle of the treasure they hold in rocky vaults in their bosoms, waiting to be unlocked and given up to the demand of a world's industries."

The *Citizen* says that Tucson's pressing need is a smelter of large capacity for custom work.

MECHANICAL PROGRESS.

Tinkering.

An unfortunate weakness of some in charge of machinery is a desire to be constantly tinkering at it, under the mistaken impression that they are improving its performance. The reverse is the truth oftener than otherwise. With new engines and machines, it sometimes happens that the parts chafe a little through some oversight in fitting up, and require to be eased, but when it comes to resetting valves and general overhauling, though there may be instances where it is required, in most cases it is a mistake to attempt it.

Here and there, perhaps, a little slide-valve engine has been set cold, so that when it gets to work hot, the valve does not work properly; but most automatic engines, we might doubtless say all, have been correctly set by the indicator before being out of the shop, and no one can correct their performance by merely guessing at what is going on in the cylinder, and assuming that the performance can be improved by shifting the eccentrics hap-hazard.

Engines which require the fewest repairs are those that have had the least tinkering done upon them, and that, as a rule, applies all over. It is the same in the machine shop; some are eternally on hand terms with their lathes, or shapers, or planers. We recall one man who was so often upon his knees about his lathe and had so many quarrels with its performance, that he gained a nickname which stood in lieu of his proper one, and after all his fussing with his lead-screw, and feed-gear, and cone-pulley, and hearings, he did the poorest work in the shop. Perhaps because he was a tinker.

It is a good thing to know when a machine is in order, and to keep it so; in other words, "let well enough alone."—*The Wood Worker.*

Steam-Cylinder Lubricator.

At the late Frankfurt exhibition, Mr. Joseph Patrick obtained a bronze medal for his steam-cylinder lubricator, which is especially interesting, as its action depends upon a new application of the unequal expansion of two metals, or, correctly speaking, alloys. The lubricator consists of a gun-metal cup, containing a second cup, also of gun-metal, held by a conical rim. The latter is provided with a number of small holes in order to afford communication between the inside of the second cup and the annular space between the two cups, thus equalizing the pressure or vacuum, as the case may be. The two cups are held together by a cover screwed on the outer one, this cover being provided with an air-tight compartment in order to prevent condensation in case the lubricators are exposed to the cold as in locomotives. The bottom of the inner cup is provided with a conical hole closed by a steel plug which will rise from its seat as soon as steam is admitted, the gun-metal expanding in a greater degree than the steel. A passage for the oil is thus afforded, varying in size according to the temperature of the steam. When the apparatus cools, the plug again closes the orifice, thus preventing all waste of oil when the engine is not at work. In case the hole should become stopped, the steel plug will force out the foreign substance as soon as the metals contract. As an additional precaution, a strainer is placed near the bottom of the cup, to prevent impurities entering with the oil. The lubricator cannot freeze while in action, even in the coldest weather, as the space between the two cups is filled with steam. If the flow of oil be too small, the plug should be slightly screwed upward; and if too large it should be screwed downward. This can be done with an ordinary turnscrew, if necessary, while the engine is running, and oil may be supplied at any time. The great advantages of this lubricator are that the consumption of oil can be regulated to a nicety; it operates without condensation, wick, springs, valves or taps; and there are no working parts to wear out, or fine holes to become stopped.

AMERICAN VS. ENGLISH STEEL.—It was but a short time ago when English blacksmiths in this country could not find any good in American steel. They would not work anything but English steel. When given anything which they suspected to be American steel they were sure to spoil it and were loud in their protestations against it. But in time manufacturers found that American steel was of satisfactory quality the moment its origin was disguised by being provided with English marks. All this has long been outgrown. American steel stands upon its own merits to-day and is everywhere regarded superior for many purposes to its English rival. At present it is even shipped to England and is being used in large quantities in the very districts where once the prejudice was hottest against it.—*Blacksmith and Wheelwright.*

HIGH BOILER PRESSURE.—According to the *Moniteur Industriel*, Messrs. Imbert Freres, of St. Chamond, are making an iron boiler, to be tested to 100 kilos. per centimeter, or 1,420 lbs. per square inch, which is 10 times the testing pressure of ordinary boilers, and more than double that of any boiler made hitherto. The plates are one and one-eighth to one and one-half inches thick, and as this makes it impossible to rivet them, Messrs. Imbert Bros. have welded them by special machinery they possess. It is not stated what purpose this boiler is intended for.

Setting the Valve of an Engine.

My method of setting the valve of an engine is as follows:

Before the cover is put on the steam chest I disconnect the eccentric rod and take a piece of very thin tin and put in the port and move the valve up against it. I then take a sharp-pointed tram, that will reach from some fixed point on the steam-chest, where I have made a fine prick-punch mark to any convenient part of the valve stem, and there make another prick-punch mark; then I put the tin in the opposite port and move the valve against it, and then with the tram in the same point on steam chest make another prick-punch mark on the stem. When this is done I put on the cover and connect the eccentric rod.

To find when the crank is on the exact center, I bring the cross head to within about half an inch of the end of its travel. I take a pair of dividers, and from a point on the cross head I strike a segment of a circle on the guides, and before moving the engine I make a tram that will reach from the floor or wall to the fly wheel, and make a mark on the wheel. I then move the engine in the direction that it is to run, until the cross head has passed the end of its travel and returned to a point where the dividers will again intersect with the segment already made on the guides. I then with my tram make another mark on the fly wheel, and just midway between the marks I make a prick-punch mark as a dead-center mark, and then repeat the operation at the opposite end of the guides. The next move is to bring the fly wheel to a point so that the point of the tram will just enter the dead-center mark, and the crank is on its exact center.

I then take the tram that I used to mark off the valve stem and place the point of tram in the punch mark on steam chest, and make a mark on the valve stem; then move the fly wheel until the other dead-center mark is reached, and again mark the valve stem.

Then compare the marks on the valve stem with the punch marks, and lengthen or shorten the eccentric rod as the case may be, to bring them to an equal distance from the punch marks. If more or less lead is desired move the eccentric, and, to see that you have just what you want, place the tram in the center on steam chest, and compare the point with the prick mark, and the difference will be the lead, if the difference is between the center marks, for if outside it would show that the valve covered.

In all cases move the engine in the direction that it is to run, and if by accident it is moved by the dead-center mark, it must be backed up far enough, so that when you move forward again all lost motion will be taken up before reaching the mark.—*H. Reynolds, in American Machinist.*

FRICTION MACHINERY.—The operation of friction machinery has now become a fixed fact, and its easy adaptability where waste power can be utilized is a marked feature. A machine of this kind has come into use, which consists simply of an iron cylinder one foot long and one foot in diameter, having a fixed plate of hardened iron in one end, and a second plate attached to a revolving shaft, which presses lightly or closely upon the fixed plate, as circumstances require. The cylinder is filled with water, the shaft revolves, and from the friction of the plates, the water in an incredibly short time is heated, and by means of steam pipes, can be carried to great distances for heating purposes. The machine is so constructed as to render it easily adapted to all places where there is waste power, as in mills, factories, public buildings, cars, etc. The power required for its operation is very slight; thus, to carry a machine with 36 square inches of friction plates—the ordinary size—one-horse power only is required, while a machine with 225 square inches of friction surface will require, at most, but six-horse power.

ERECTING WROUGHT-IRON CHIMNEYS.—At the Pennsylvania Steel Works, at Harrisburg, they have a good plan of erecting the casings of fire-brick hot-air stoves and wrought-iron chimneys. Two new blast furnaces are erecting there, with six Whitewell stoves, 18 ft. in diameter, 60 ft. high. Instead of putting the *bottom* plates of the stove together on the ground and building the rings up from bottom to top, they commence with the *top* plates, and top ring of the stove. They are first erected on the ground and riveted and calked complete; then with three very large screw-jacks, having a lift of about six ft., and placed at equal distances around the site of the stove, worked by men with winch handles, this first ring is carefully and evenly lifted high enough to enable the workmen to put on the next ring of the plates, five ft. deep. This ring also riveted and calked complete, then another ring is added and lifted, and so on until the whole stove is completed. The wrought-iron chimney, 175 ft. high, for working these stoves, was erected in the same way.—*American Manufacturer.*

THE work on the Yale-Savon branch of the Canadian Pacific Railway is progressing rapidly. The total expenditure to the end of the year's work was $1,900,000. It is reported that a syndicate of California and Eastern capitalists is formed to build the railway from Esquimalt to North Island, taking land as remuneration.

SCIENTIFIC PROGRESS.

SCIENCE OF PERFUMES.—By a process known as inflenrage, which is the exposure of beef fat to fresh flowers in close boxes until it is thoroughly permeated and charged with their odors, the perfumes of six flowers are obtained, which could in no other manner known to science be preserved apart from the fresh petals. Those flowers are violet, jasmine, tuberose, rose, orange flower and cassie (cinnamon flower). From those six there are 50 or more combinations made for the simulation of the odors of other flowers. Sweet pea is made with jasmine and orange flower; hyacinth is counterfeited by jasmine and tuberose; lily of the valley by violet and tuberose. But the resources of the perfumer are by no means confined to the pomades, as the scented fats are termed. He uses many essential oils, the principal of which are sandal wood, bergamot, lemon, rosemary, neroli (made from bitter orange flowers), patchouli and ottar of roses. It is very difficult to get the last-named in a pure state, because its great cost tempts to dishonest adulteration. Very often rose-geranium oil is substituted for it. Musk is another important ingredient, entering, as it does, into almost all perfumes, except those which are actually imitations of flower odors, or, as styled by perfumers, "natural," as, for instance, heliotrope, tuberose, white rose and violet.—*Boston Herald.*

THE COLOR OF WATER.—Mr. Boas recently described a number of experiments on the color of water, some of which were qualitative, sunlight being sent through water in a zinc tube about 46 ft. long, closed with glass plates. Distilled water thus gave a fine deep blue-green color; the red was quite gone, the yellow feeble, while the maximum brightness was in the green. Water of the Kiel supply, Germany, let no light through the length of the tube stated; with half the length, it appeared deep orange; blue and green failed. In his quantitative experiments, Mr. Boas illuminated two screens with the same light source, before which was placed red glass, or sulphate of copper solution. The light from one screen went through water in a tube; that from the other along the tube outside. Both beams were brought into a position for comparison by means of total-reflection prisms; the screens were shifted till equal brightness was reached, and from their position the coefficients of absorption could be approximately inferred.

ELECTRICITY AND METALLURGY.—The *Cote Libre* relates the following interesting experiment made by Mr. Siemens in the presence of the members of the late Electric Congress. A number of broken pieces of steel were put in a suitably arranged crucible, with a perforated lid to it. The two currents of the electro-motor terminate in the upper and the lower part of the crucible. In fourteen minutes the entire mass of metal was heated, turned red, and liquefied. There was not a single bubble in the mass. The cost of fuel required for this apparatus is very much less than that which would be wanted if the fusion were effected by the direct application of the heat. A considerable saving may consequently be effected in steel works if this proceeding can be generally applied. It appears that the fitting up of the apparatus involves little or no difficulty.

PLANETS AND SUN SPOTS.—Adolph Duponchel has presented a communication to the French Academy upon the agreement of the increase of the frequency of sun spots with the increased action of the planets upon the sun at the time of their nearest approach to that central orb. To test his theory he ventures the prediction that there will be an increase of the mean temperature in any given place during the 12 years to come over that of the 12 years which have just passed. Uranus and Neptune are about receding from their perihelia, and he anticipates an effervescence in the solar atmosphere, analogous to that which occurred between 1716 and 1725. He thinks this solar disturbance will be accompanied with an increased number of sun spots, of which the maximum will occur, not in 1882, as is generally supposed, but between 1888 and 1892.

ACTION OF LIGHT UPON OXYGEN.—J. Dessans has contrived an apparatus for governing the admission of the radiations from a Drummond light into a jar of oxygen, and he concludes, from experiments which he has frequently repeated, that light effects a direct transformation of oxygen into ozone. In the course of his experiments he sometimes used the oxygen as pure as possible, and in other cases he introduced substances which are easily oxidizable, so that they might readily combine with the ozone. Both methods of experimenting led to the same result.—*La Nature.*

MODIFICATION OF ANÆSTHETIC METHODS.—The *Revue de Chirurgie et Arch. Med. Belge* observes that Messrs. O. de Stefanis and Vachetta, convinced of the dangers attending the use of anæsthetics—statistics showing that with chloroform there appeared one death in 2,873 cases; with ether, one in 23,204; while bichloride of ethylene showed one death in 5,000 cases—propose a modification, which has already given them excellent results, both upon men and animals.

Progress of Biology in England.

The biological section is that with which I have been most intimately associated, and with which it is, perhaps, natural that I should begin. Fifty years ago it was the general opinion that animals and plants came into existence just as we now see them. We took pleasure in their beauty; their adaptation to their habits and mode of life in many cases could not be overlooked or misunderstood. Nevertheless, the book of nature was like some richly illuminated missal, written in an unknown tongue; the graceful forms of the letters, the beauty of the coloring, excited our wonder and admiration; but of the true meaning little was known to us; indeed, we scarcely realized that there was any meaning to decipher. Now glimpses of the truth are gradually revealing themselves; we perceive that there is a reason—and in many cases we know what that reason is—for every difference in form, in size, and in color; for every bone and every feather, almost for every hair. Moreover, each problem which is solved opens out vistas, as it were, of others perhaps even more interesting. With this great change the name of our illustrious countryman, Darwin, is intimately associated, and the year 1859 will always be memorable in science as having produced his great work on "The Origin of Species." In the previous year he and Wallace had published short papers, in which they clearly state the theory of natural selection, at which they had simultaneously and independently arrived. We cannot wonder that Darwin's views should have at first excited great opposition. Nevertheless, from the first they met with powerful support, especially in this country, from Hooker, Huxley, and Herbert Spencer. The theory is based on four axioms:

"1. That no two animals or plants in nature are identical in all respects.

"2. That the offspring tend to inherit the peculiarities of their parents.

"3. That of those which come into existence, only a small number reach maturity.

"4. That those which are, on the whole, best adapted to the circumstances in which they are placed are most likely to leave descendants."

Darwin commenced his work by discussing the causes and extent of variability in animals, and the origin of domestic varieties; he showed the impossibility of distinguishing between varieties and species, and pointed out the wide differences which man has produced in some cases—as, for instance, in our domestic pigeons, all unquestionably descended from a common stock. He dwelt on the struggle for existence (which has since become a household word), and which, inevitably resulting in the survival of the fittest, tends gradually to adapt any race of animals to the conditions in which it occurs. While thus, however, showing the great importance of natural selection, he attributed to it no exclusive influence, but fully admitted that other causes—the use and disuse of organs, sexual selection, etc.—had to be taken into consideration.—*Sir John Lubbock, in Popular Science Monthly.*

CURIOUS ACOUSTIC PHENOMENON.—M. Reulaux reports a singular instance of the production of sound by natural causes. During a hunt upon the Roderhacherthal he passed through a valley, broad upon the eastern side, but narrowing rapidly towards the west, so as to form a kind of defile. The wind was blowing from the southwest, and the observer was marching upon the eastern declivity, when he seemed to hear repeated strokes of a fine deep-toned bell. There was no bell in the neighborhood, and other sounds which he heard soon proved that the phenomenon was meteorological. The sounds increased in intensity, and then diminished after having passed through a maximum. They resembled, at times, those of an organ, and at other times those of a harp or violin. At the entrance of the defile, from which the sounds seemed to come, there arose a strange agitation of the air, when the sounds became confused, and some of the notes suddenly ceased. M. Relaux supposes that currents of air were forced through the gorges, and that the sound was due to a conflict between the exterior and interior air, which produced musical vibrations. There was a very marked difference of temperature between the upper and lower portions of the valley, so that the upper and cold current pressed upon the lower and warmer air, thus closing the gorge so as to make a kind of tube. There appeared to be no wind, except in the lower part of the gorge.—*Les Mondes.*

PERIODIC VARIATIONS OF GLACIERS.—M. F. A. Forel, of Morges, presented to the first general meeting of the Swiss Society of Natural Science his investigations upon the periodic variations of glaciers. The present remarkable period of glacial retreat began about 1840 in some places, but the Unteraar glacier did not begin to diminish until about 1871. The period is now coming to an end and many of the glaciers are beginning to increase again. The differences of length are immediately traceable to periodic variations in the velocity of flow, which are due to corresponding variations in the thickness of the glacier. These are due partly to differences of snow-fall upon the summits, partly to variations in the summer heat; the latter cause has probably only secondary influence. The retreat which is just ending is attributable to a deficit of snow which dates back from 40 to 60 years and a series of warm summers for the past 20 years.—*Les Mondes.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Mar. 9.		Week Ending Mar. 16		Week Ending Mar. 23		Week Ending Mar. 30	
Alpha	1¼	1.10	1½	1.10	1½	60c	80c	55c
Alta	3.35	2.70	3.40	2 65	3.15	2.90	3.10	2.15
Andes	75c	45c	75c	45c	65c	70c	75c	65c
Albion	2.90	1.80	3.45	2.60	3.20	2.95	2.80	2.20
Argenta	....	....	....	....	10c	....	30c	....
Addenda	....	....	25c	....	10c	....	15c	10c
Belcher	60c	20c	75c	55c	60c	50c	55c	45c
Belmont	50c	....	50c	....	....	....	....	....
Beat & Belcher	6¾	6	6¼	6	6¾	6	6¾	5¾
Bullion	95c	65c	75c	70c	75c	55c	50c	25c
Bechtel	35c	30c	35c	....	35c	30c	30c	....
Belle Isle	....	....	....	....	....	....	....	....
Bodie	4.80	4.35	4.95	4.20	4.45	41	6	4.65
Benton	60c	50c	45c	35c	45c	40c	45c	25c
Bulwer	2	1.85	1¾	....	2.10	2	2¼	....
Boston	....	....	....	....	50c	....	50c	....
Back Hawk	....	....	10c	....	....	....	15c	10c
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	....	....	....	....	....	....	5c	....
California	45c	30c	35c	30c	35c	25c	30c	15c
Challenge	40c	....	....	....	....	....	....	....
Concordia	70c	....	80c	75c	....	....	1.65	1.60
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	30c	....	25c	....	....	....	35c	30c
Derbec	....	....	....	....	....	....	....	....
Day	1¾	....	1¼	1.40	1¾	1.35	1.95	1.40
E. Mt. Diablo	30c	25c	25c	20c	25c	20c	20c	15c
Eureka Con	1¾	1¾	23	19	24	19¾	23¾	21¾
Excbequer	60c	40c	50c	40c	45c	40c	35c	25c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	40c	....	35c	....	25c	....	50c	30c
Gould & Curry	3.25	3.05	3.30	3.10	3.55	3.30	3.20	3
Hale & Norcross	1.55	1.05	1.30	1.05	1.20	1.05	1.05	90c
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	20c	....	15c	....	15c	10c	10c	....
Justice	70c	65c	75c	55c	70c	55c	60c	50c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	....	....	....	25c	20c	30c	25c
Kosutb	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	50c	....	....	....
Leviatban	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	45c	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1¾	....	....	....	1¾	....	1¾	....
Martin White	7¾	....	7¾	7	6¾	6¾	8	7¾
McClinton	....	....	....	....	....	....	....	....
Mono	1.45	1.35	1¾	1¾	1¾	1¾	2.40	1.85
Mexican	9¼	3¾	8¾	8¾	8¾	7¾	7¾	6¾
Mt. Diablo	6¾	6¼	6	....	6	5¾	5¾	4¾
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	35c	30c	1.05	40c	1¼	90c	1.70	1.40
New York	....	....	....	....	....	....	5c	....
Northern Belle	10	9¾	9¾	9¾	9	8¾	8¾	6¾
Nortb Noonday	30c	....	75c	50c	1¼	70c	1¼	1.45
Navajo	....	....	30c	....	35c	30c	40c	45c
Occidental	....	....	75c	70c	75c	....	80c	....
Ophir	4¼	3¾	3.65	3¾	3.65	3.10	3.05	2.80
Original Keystone	....	....	....	....	....	....	....	....
Overman	55c	40c	45c	35c	35c	30c	30c	25c
Oro	40c	30c	40c	30c	40c	30c	65c	45c
Paris	....	....	....	....	....	....	1	50c
Potosi	1.10	85c	1.05	....	1.15	95c	1	90c
Queen Bee	....	....	....	....	....	....	5c	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.40	1	1.20	1	1.20	90c	95c	80c
Seg Belcher	2.40	1.60	1¾	1¼	2¼	1.85	1¼	....
Sierra Nevada	8¾	7¼	7¾	7¼	7	6¾	7	6¼
Silver Hill	....	....	....	....	15c	....	15c	....
Silver King	16½	16¼	18	17¼	17¼	17¼	17¼	17¼
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	25c	10c
Scorpion	90c	70c	80c	65c	90c	70c	75c	65c
Solid Silver	....	....	....	....	....	....	....	....
Soutb Bodie	....	....	....	....	....	....	....	....
Soutb Standard	....	....	....	....	....	....	....	....
Syndicate	....	....	15c	....	20c	....	40c	20c
Tioga Con	30c	25c	20c	....	25c	20c	40c	25c
Tiptop	....	....	5	....	4.60	....	4¼	4
Tuscarora	....	....	....	....	....	....	....	....
Union Con	11⅝	10⅞	11⅞	10⅝	11⅞	10	10⅝	9⅛
Utah	5¾	4¾	4¾	4.35	4.65	3.80	4	3.70
Ward	....	....	3¼	....	31	....	3¼	3
Wales	55c	50c	55c	....	60c	55c	60c	50c
Yellow Jacket	70c	20c	1.45	1.10	1.05	1	1.10	95c

Sales at S. F. Stock Exchange.

Thursday A.M., Mar. 30

115 Alpha.....60c@55c
1870 Alta.....3¾@3.15
290 Andes.....65c
70 B & Belcber.....5¾
200 Belcher.....50@45c
50 Bullion.....25c
700 Benton.....30@25c
110 Confidence.....60c
385 California.....15@20c
200 Con Virginia.....10c
100 Chollar.....1.05
300 Crown Point.....40c
305 Excbequer.....25@30c
350 Gould & Curry.3.10@3.15
770 Hale & Nor.....90c
600 Justice.....50c
200 Julia.....10c
50 Kentuck.....25c
230 Mexican.....7¼
130 Ophir.....2.30@2.85
350 Overman.....25c
200 Potosi.....90c
300 Savage.....95@90c
300 Sierra Nevada.....6¾
300 Silver Hill.....15c
25 Utah.....3¾@3.70
175 Union.....10c@9¾
100 Yellow Jacket.....95c

AFTERNOON SESSION.

1460 Albion.....2¾@2.85
200 Addenda.....15c
100 Atlas.....1.40
100 B O'Neill.....90c
120 Bodie.....5@5¼
125 Bechtel.....25@35c
50 Black Hawk.....15c
207 Boston.....35c
220 Concordia.....1¼@1.70
540 C Pacific.....30c
1040 Day.....2@2.05
30 Eureka Con.....22
400 E Mt Diablo.....20c
850 Goodsbaw.....40@45c
500 Head Center.....9c
5 Manbattan.....1¼
20 Mt Diablo.....4.90
150 Mono.....1.65@1.70
305 M White.....8
50 Northern Belle.....8
100 Noonday.....1.40@1.30
200 Navajo.....75c
300 N Belle Is.....10c
300 N Noonday.....1.10@1.05
950 Oro.....50@40c
100 Paris.....45c
100 Pinal.....2
1600 Queen Bee.....5c
200 Syndicate.....40c
250 Southern Nev.....6¼@6¾
50 Summit.....20c
125 Tioga Con.....30c
100 Tiptop.....4

FATAL ACCIDENT AT POWDER WORKS.—An accident, most fatal in its results, occurred at the Black Powder works, owned by the Vulcan Powder Co., at Stege Station, Contra Costa County, Monday last. Six white men and six Chinamen were burned to death and two or three badly injnred. The fire originated in the incorporating house, and almost instantly spread to the dry house, some 100 feet distant, hut connected hy an elovator. The men attempted to escape, hut the fire caught them all. These works are between the late Enreka Powder works, which exploded in March, 1881, and the Tonite Powder works. These latter works were not injured in any way hy either the explosion or the recent fire.

AT a meeting of the new managers of Ingersoll Con., the following Directors were elected: Jo. Clark, President; J. B. Lewis, Vice-President; W. B. Carr, L. C. McAfee, S. Steiner, J. C. Stump, E. M. Heller; Calvert Meade, Secretary.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Albion Con M Co	Nevada	10	30	Mar 6	Apr 10	May 2	D B Chisholm	327 Pine st
Alpha Con M Co	Nevada	16	50	Mar 20	Apr 26	May 19	Wm Willis	309 Montgomery st
Belmont M Co	Nevada	31	15	Mar 11	Apr 17	May 15	J W Pew	310 Pine st
Belvidere M Co	California	13	25	Feb 9	Apr 12	May 1	C V D Hubbard	310 Pine st
Benton Con M Co	Nevada	7	25	Mar 10	Apr 14	May 4	Wm H Watson	302 Montgomery st
Bullion M Co	Nevada	23	30	Mar 29	May 2	May 25	J M Brezell	328 Montgomery st
California M Co	Nevada	3	20	Mar 29	May 6	June 5	G P Gordon	309 Montgomery st
Con Virginia M Co	Nevada	17	30	Jau 31	Mar 11	Apr 8	A W Havens	309 Montgomery st
Crown Point G & S M Co	Nevada	47	25	Feb 16	Mar 23	Apr 13	J Newlands	327 Pine st
Day S M Co	Nevada	10	50	Jan 28	Mar 6	Apr 3	E M Hall	327 Pine st
Fall Creek M Co	California	5	30	Feb 16	Mar 24	Apr 19	W Willis	309 Montgomery st
Goodshaw M Co	California	10	10	Mar 21	Apr 22	May 11	C C Harvey	309 Montgomery st
Hale & Norcross S M Co	Nevada	73	50	Mar 14	Apr 19	May 10	J F Lightner	309 Montgomery st
Independence M Co	Nevada	9	15	Feb 24	Mar 31	Apr 24	E M Hall	327 Pine st
Iowa M Co	Nevada	16	03	Mar 8	Apr 15	May 6	C C Leavitt	411½ California st
Mayflower Grav M Co	California	15	10	Mar 7	Apr 11	May 3	J Morizio	328 Montgomery st
McMillen M Co	Arizona	4	30	Feb 8	Mar 14	Apr 12	J Morizio	328 Montgomery st
Mexican G M Co	Nevada	18	1 00	Mar 13	Apr 15	May 9	C L McCoy	309 Montgomery st
Modoc Con M Co	California	10	30	Feb 14	Mar 28	Apr 25	J W Pew	310 Pine st
Mono G M Co	California	16	30	Feb 7	Mar 14	Apr 3	W H Leut	309 Montgomery st
Napoleon M Co	California	2	03	Feb 18	Mar 23	Apr 8	H Smith	309 Montgomery st
North Gould & Curry G & S M Co	Nevada	2	20	Mar 18	Apr 19	May 11	C H Mason	331 Montgomery st
Opbir S M Co	Nevada	41	1 00	Mar 7	Apr 8	May 2	C L McCoy	309 Montgomery st
Pinal Con M Co	Arizona	2	30	Jan 24	Mar 7	Apr 3	W W Traylor	309 Montgomery st
San Jose M Co	Nevada	18	75	Jan 30	Mar 15	Apr 19	A Carrigan	109 Front st
Savage M Co	Nevada	50	50	Mar 7	Apr 10	May 1	E B Holmes	329 Montgomery st
Scorpion S M Co	Nevada	11	10	Mar 9	Apr 13	May 4	G R Spinney	310 Pine st
Seg Belcher M Co	Nevada	21	1 00	Feb 14	Mar 20	Apr 10	G D Edwards	414 California st
Sierra Nevada S M Co	Nevada	72	1 00	Mar 23	Apr 26	May 15	E L Parker	309 Montgomery st
Silver Lick Con M Co	Nevada	1	05	Mar 29	May 6	May 27	L J O'Farrell	Montgomery Block
Silver Belt M Co	Arizona	1	15	Mar 8	Apr 17	May 15	J W Pew	310 Pine st
Union Con S M Co	Nevada	19	1 00	Mar 21	Apr 25	May 15	J M Buffington	309 Montgomery st
Utah S M Co	Nevada	39	1 00	Mar 11	Apr 14	May 3	C C Pratt	309 Montgomery st
Yellow Jacket S M Co	Nevada	44	1 00	Feb 7	Mar 4	Apr 11	M Otey	327 Pine st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Bay State S M Co	Nevada	1	02	Dec 29	Mar 31	Apr 24	J W Pew	310 Pine st
Bed Rock M Co	Arizona	1	05	Feb 6	Mar 13	Apr 3	O H Graves	6 Post st
Caborca M Co	Mexico	5	30	Feb 25	Mar 29	Apr 17	W L Elliott	220 Sansome st
Equator M Co	——	—	20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Metallic M Co	——	—	20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Metallic-Equator M Co	——	—	20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Pinal Copper M Co	Arizona	3	2 50	Jan 28	Mar 20	Apr 10	Geo T Shaw	340 Fourth st
San Pedro G & S M Co	California	4	03	Feb 27	Apr 3	Apr 27	W G Holmes rm 1, Sherman's build'g

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Bulwer Con M Co	California	Wm Willis	309 Montgomery st	Annual	Apr 12
Hope Con M Co	——	F S Monroe	331 Kearny st	Annual	Apr 13
Maryland Con M Co	——	E P Farnsworth	219 Sansome st	Annual	Apr 6
McElroy G M Co	California	Lewis Lillie	607 Washington st	Special	Apr 17
Sigourney G & S M Co	——	A Judson	320 Sansome st	Special	April 15
Tioga Con M Co	——	Wm H Lent	309 Montgomery st	Annual	Apr 10

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Apr 12
Contention M Co	——	D C Bates	309 Montgomery st	25	Feb 28
Northern Belle M & M Co	Oal	Wm Willis	309 Montgomery st	50	Mar 15
Silver King M Co	Arizona	J Nasb	315 California st	25	Mar 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Mar 13
Vizina Con M Co	Arizona	J E Haskel	30 Pine st	10	Jan 3
Vizina Con M Co	Arizona	J E Haskell	30 Pine st	10 (extra)	Jan 3

The Mining Share Market.

Stocks continue dull. There is not a single mine on the Comstock that is in two figures with respect to price as expressed in dollars. The highest priced stock is the Union Consolidated, which is now selling at $9.62½, or less than $1,000,000 for the mine, which, a few years ago was paid for 5,000 shares of the stock. At that time the mine was supposed to he worth $20,000,000. Comparatively good Comstock mines can now he hought for $100,000. Others can he hought for $50,000, and at least one for $5,000, or at that rate. As to the honanza in Noonday mines, the Bodie *Free Press* says:

It may he stated that the development is in a joint winze between the Noonday and North Noonday mines, which has attained a depth of 200 ft. on the vein helow the 512-ft. level. Some rich ore was encountered in sinking this winze, in a short drift about 70 ft. from the hottom. This ore has continued to improve in quantity and qnality. Fourteen ft. from the hottom a drift was run north 40 ft. and south 15 ft., on the foot-wall of the ledge, throughout which there is about four ft. of rich ore, the halance of the vein, so far as opened, being about the same quality as in the levels above. At the lowest extremity of the winze a crosscut has heen run in 20 ft., hut as yet the hanging wall has not been encountered. Six ft. of this ore on the foot-wall, or western side of the vein, is rich, as is also some in the eastern face of the cross-cut. The ore is of a different character in many respects from any which has been found in the district, which is not surprising, considering that it is found at a greater depth helow the water line than at any other point in the camp. The metal is principally in the shape of gold and silver sulphnrets, and the assays turn out much hetter than one accustomed to the general rnn of Bodie ores would snppose from looking at them. The rock is said by those who are familiar with the subject to resemble in appearance the ore from the old Con. Virginia and California honanzas.

The *Bulletin*, in speaking of the Yellow Jacket mine, says:

The Yellow Jacket mine is one of the very few mines in Nevada, operated in California, that is incorporated under the laws of Nevada. That, however, is not the only peculiarity of the mine. It is also one of the oldest claims on the Comstock, and has at times heen the most popular and speculative. Not to hold Yellow Jacket was once considered equivalent to heing out of stocks altogether. The mine has not heen so prolific as Belcher and Crown Point, hnt up to the time of the opening of the last honanza in those mines, it was the leading claim in the Gold Hill group. Its hullion output is reported at $14,372,000. There have heen 25 dividends paid, amounting to $2,184,000, hut all these were paid prior to the last discovery of ore in the Crown Point and Belcher mines. The report for June 30, 1867, shows five dividends of $600,000 in that fiscal year. The last dividend paid was August 5, 1871. Since then things have not heen very prosperous at the Yellow Jacket mine. Had the claim heen abandoned at that time, it would have heen of immense advantage to stockholders. But for the ore discovery in Crown Point, about that time, it is thonght that the whole Gold Hill group would have heen forsakeu or passed to the control of foreign capital. Since 1871 the mine has heen a constant sonrce of expense. The stock was originally divided into 24,000 shares. But the great demand for money necessitated an increase in the numher of shares to 120,000. The forty-fonrth assessment is now in process of collection. This will make a total of $5,358,000 drawn from the pockets of stockholders, against $2,184,000 received in dividends. Of the assessments, 14 have heen collected in a little over three years, the same aggregating $1,560,000.

Bullion Shipments.

We quote shipments since our last, and shall he pleased to receive further reports:

Silver King, 22d, $14,425; Eureka Con., 6th, $20,289; Standard, 14th, $20,210; Star, $2,149; Northern Belle, 20th, $6,561; Mount Diablo, 21st, $7,706; Christy, 22d, $2,205; Contention, 25th, $15,285; Eureka Con., 21st, $10,801; Standard, 21st, $17,869; Gold Hill, 12th, $28,000; Northern Belle, 23d, $7,056; Lyon Mill, 20th, $16,850; Tip Top. 20th, $10,398; Monnt Diablo, 25th, $9,082; Christy, 24th, $2,230; Bodie, 21st. $7,772; Star, 24th, $2,280; Contention, 25th, $17,764 11; Enreka Consolidated, 22d, 23d, 24th, 25th, $22,492 11; Bodie Tunnel, 29th, $3,100; Germania, 21st, $5,000; Hananer, 21st, $2,400; Horn Silver, 21st, $1,000; Barhee & Walker, 21st, $1,978; Roht. E. Lee, for February, $60,000; Horn Silver. 22d, $12,500; Germania, 23d, $1,840; Hanauer, 23, $2,700; Mammoth, 23d, $2,428; Horn Silver, 24th, $10,000; Frisco, 24th, $5,449; Mammoth, 24th, $1,349; Horn Silver, 25th, $10,000; Barhee & Walker, 25th, $1,592.

ARIZONA HYDRAULICS.—The Prescott *Courier* says: Messrs. Harrington and Smith, from the hydraulic mines of lower Lynx creek, were here yesterday. Eleven men are now employed in the diggiugs; two strings of sluices are run. The gravel gives, hy pan process, from one-half cent to two cents per pan. No clean-up has, as yet, heen made. Ahout 175 inches of water are nsed, 75 for the pipes and 100 in the ground sluices. These diggings are not to exceed eight miles east of Prescott. They are extensive and though not as rich as diggings we have seen, are rich enough to pay well when properly worked, as they are hy those who are now working them. We know of a great many other good deposits of gravel in this county which, in a year like this when water is ahundant, should not he permitted to retain the gold that is in them.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

VOLCANO.—Cor. Amador *Ledger*, March 25:—The storm has increased the supply of water to an extent unknown before this season, enabling miners to crosscute work on a larger scale. The Tunnel company are able to run almost continually, thereby rapidly enlarging the vacuum in the basin. If the supply continues for two months the clean-up will send the stock up booming. The Golden Gate has shut down for a short time, for the purpose of making some necessary repairs. The mill at the Acme has been started up.

HAZARD.—The Hazard claim, near the Bunker Hill, and owned by A. Hayward, is employing a force of 6 men under the superintendency of H. Rees.

MARYLAND.—No developments worth speaking of have been made at the Maryland claim. The English company have been prospecting for 3 years, spending a large amount of money. Previous to their operations at the Maryland, the same company had expended in the neighborhood of $2,000,000 in the purchase and development of the Original Amador, at Amador City, without reaping any benefit commensurate with this vast outlay. It is hoped that this wealthy and enterprising company may yet succeed in striking a permanent and paying mine in the county where it has spent so much in the search therefor.

KELLY G. M. CO.—The Kelly Gold Mining Co. is comprised mainly of Boston capitalists, although incorporated in the State of Maine. The mining ground which it proposes to develop consists of 3,000 linear feet on the main mineral belt which runs through Murphy's ridge, about 2½ miles south of Jackson. Ore can be broken at five different points in the tunnel, and from the shaft, and run to the mill at trifling cost. There is no question about the quantity of rock being there to keep the 20-stamp mill running steadily. The one point that remains to be determined is whether the rock contains gold in paying quantities. If it surrenders $5 per ton it will pay. All of it, we are informed, prospects well; but no test by mill process has been had; and until the batteries have spoken on this vital question, all conjectures are vain. The 20 stamp mill is rapidly approaching completion. A little track laying and some work on the reservoir is about all that remains to put the mill in running order. It is a substantial piece of work. The stamps are 750 lbs. each. Water will be the motive power, supplied from Horne's ditch. It has a pressure of 250 ft, and 40 inches will be sufficient to run the machinery. It is thought that from 40 to 50 tons can be put through daily. Altogether, there is an air of thrift and good management about everything connected with the works. Blacksmith shop, lodging house, and everything complete, but not the least approach to extravagance. About 30 men are employed steadily, and they are paid regularly every month. Should this mine turn out well, there will be no lack of Eastern capital to take hold of other dormant claims in that mineral section.

BUTTE.

OCON MINING PROPERTY.—Oroville *Mercury*, March 24: Situated 32 miles from Oroville, on the Quincy stage road, near the line of Butte and Plumas counties, and not far from Walker's plains is the Black Rock hydraulic mining claim of 110 acres, which is held under a U. S. patent by Lewis Burwell, W. Dana Perkins and Moses M. Drew. Connected with the property is a ditch with a capacity of 1,500 inches, which takes the water from Grizzly creek, supplying a sufficient quantity to run the mine for 3 months of the year only. A continuation of the ditch is contemplated to tap Buck's creek, which, with the aid of reservoirs, will afford a constant supply for the entire year. In 1868, the Black Rock mine was slightly worked, the hydraulic apparatus being 7-inch iron pipe, to which was attached canvas hose and an ordinary sheet-iron butt with small brass nozzles The depth of gravel is from 80 to 200 ft, and prospects are obtained in each pan washed from the extreme surface to bedrock. About 20 days' run at that time yielded $12,000. The death of one of the owners of the Black Rock about that time and the delay in settling his estate caused a removal of the iron pipe and apparatus for working the mine, and it has never been refitted. The gravel was reached through a tunnel about 400 ft long, and dumped into Marble creek, the distance from the mouth of the tunnel to the bed of the canyon being considerable and having a fall of fully 1,000 ft. The tunnel at the upper end is 40 ft in the bedrock below the bottom of the gravel channel, and is thought to be low enough to work out the entire claim. The blue gravel—some 20 ft in depth—it is said will pay 10 cents to the pan, which is remarkable, if our informant be not mistaken. Several dry ravines, and capacious, are contiguous to the dump that can be cheaply dammed for the impoundage of tailings, guaranteeing the certainty of working even should the opponents of hydraulic mining succeed in closing down those mines which dump directly into the flowing streams. It is the intention of the owners to begin operations during the summer upon an extensive scale. . . . John J. Meredith is said to be taking out considerable gold at his mine on Butte creek, near American ravine. He is ground sluicing where there is abundance of abraded quartz. . . . About the 15th inst., the Scott's Bar company, L. M. Russell, Supt., began hydraulicing upon their mine on Butte creek just above the forks. . . . On Riley's ravine, between Lovelock's and the junction, I. N. Smith, A. Corbin, Jo. and E. Bowers, J. Suffrain, Doc. Watkins and Mr. Russell are all working with varying success. . . . The Bumble Bee ledge, in Yellow Jacket ravine, near Lovelock's, is the most waspish location we have heard of lately. It is owned by John Matlock, John Boll, Jacob Harvey, Fred Long, John Benner and I. W. Kitchen, who propose to unearth some rich rock from it as soon as the snow will admit of work upon the claim.

CALAVERAS.

GLENCOE.—Cor. Calaveras *Chronicle*, March 25: Since my last the Valentine people have done hut very little, their mill being full of ore for crushing. As soon as the necessary power can be obtained they will be set running again. The ditch (Clark's) which furnishes the motive, having been closed by snow and ice during the winter. I hear it will be in order and running within the next ten days.

THE NORWICH has been pushed ahead constantly during the winter, and continues to improve in the quality and quantity of ore raised. Do not be surprised if you hear of a "bonanza" in old Calaveras in the very near future.

THE FIDELITY.—The Fidelity has changed its management in part, Mr. J. L. Hoey having resigned the assistant superintendency; the work is now being pushed under Mr. J. A. Steel's charge. The shaft is being sunk as fast as possible, though the flow of water has been quite strong. The ledge is proving one of great value—the deeper they go the larger the lead and the better the ore. I understand this company are preparing to build a 10-stamp mill on the property during the coming summer.

LEWIS & FAIRCHILD.—This mine continues to produce excellent milling ore. Its proprietors are very energetic, and are making good progress in its development.

THE SAN PEDRO.—This property has heretofore produced largely of gold bearing rock. It has a small steam engine and hoisting works, and is being put in condition under the management of Mr. Dewey, a former resident of Placer county. Work has also been resumed on the old Frank Barney mine. This mine has yielded in the past some very rich ore. It is under the superintendency of Mr. T. J. Severce, who is having the tunnel placed in first-rate condition. It is being whispered around town that the owners of the Banner mine are taking the necessary steps to obtain a U. S. patent to their property, preparatory to their again sinking upon the mine, and the

introduction of a new and more powerful pumping engine and pump. There seems to be a general determination to "put the best foot forward" in this section during the coming spring and summer.

EL DORADO.

SPANISH DRY DIGGINGS.—Cor. Georgetown *Gazette*, March 24: This being essentially an old mining camp, some few items regarding the most promising and prominent mines may be of interest to your readers as well as letting the outside world know some of the work we are doing. The McCrubb claim, worked by Gilbert & Davis, continues to keep up its reputation, is working steadily and pays well. The Hines & Co. claim is now being placed in splendid working order by its untiring and energetic manager. This, as well as the McCrubb claim, is located on the famous Cedarburg belt, and the outlook for the coming season is most prosperous. The Davis claim, also located on the Cedarburg belt, has probably had more continuous work done on it the past year than many others in this district. All its appointments are new and first-class; the hydraulic pipe used, being extra heavy and with a pressure of about 250 ft, is doing very fine work. A large cut has been run on this claim during the past year, to prepare the way for systematic working, and on a scale not before attempted. A long string of sluices are now being placed in position, and the work of opening the many seams containing gold, and which the large cut has in part developed, will begin as soon as all is prepared. This is a fine property, and the owners rightly feel a little jubilant over the prospects for the coming season. At the Cherokee Flat, worked by Freuchtricht & Co., their 7-stamp mill is running steadily with good results. The Spanish Dry Diggings claim, worked by Sornberger & Withington, has been put in good working order, and is expected to take out pay by the end of next week. The old Orit claim is now worked by the Murray Bros. with a good show to strike one of its famed rich pockets ere long. Walker, Pile & Co. are and have been steadily working their ground on Summit hill, and are now drifting on seams 150 ft below the surface. Their ground has paid them steadily for the past three years. There are quite a number of other mines here now at work, but fearing this communication is already too long, I will reserve notice of them to some future time; enough has been said, however, to show that there is considerable life and pluck left yet in this old mining camp.

THE rich strike made in the Rich Gulch seam mine, two miles below this place, turns out to be 205 ozs, or nearly $4,000. The mine belongs to Messrs. Armstrong & Baldwin. Mr. Armstrong had leased his half of the mine to Mr. Adams for 30% of what he might take out. Adams' time expires May 1st. We reckon he will make the best use of his time.

FRESNO.

OERTRUDE.—Cor. Mariposa *Herald*, March 25: The Surprise mine, owned by the McDonald Bros., is being steadily developed by them. They are down about 125 ft, with a fine body of milling ore in sight. The Red Rover, owned by Messrs. Silsmuer, Baker, Crooks and Cox, is being steadily developed by them. They are down over 40 ft, and have a fine 2½-ft ledge of very rich quartz, and as they go down it increases in richness, and I think in a short time it will be one of our best paying mines. The Antelope, the extension of the Red Rover, is being developed by its owners, Peterson & Oxindine. They are down over 70 ft in their shaft, and have a fine ledge of good milling ore. The King's gulch mine, owned by Jim Hamilton and others, is being steadily developed by them. They are down 35 ft, and have a 7 ft ledge of first-class ore. This is, without doubt, one of the best prospects in that section.

INYO.

DARWIN.—*Inyo Independent*, March 25: The Defiance furnace closed last Thursday. In last short run of 11 days 1,000 bars of bullion were smelted out.

DEEP SPRINGS.—A reliable report comes from Deep Springs this week. The Half Dollar mine is assuming a very favorable appearance. They are down in the lode about 90 ft and find good ore in the bottom, assaying from $140 to $227. A crosscut has been commenced and still more favorable results are expected as soon as the foot wall is struck.

MARIPOSA.

DILTZ MINE, WORK RESUMED.—*Gazette*, March 25: From Mr. Abel Mann, an employe upon the works, we learn that since Cap. Diltz' return home from the East, work at the mine has been resumed with the usual vigor given to it, aided by the abundant rain recently fallen, which affords sufficient water to supply the several ditches appendant to the mine. Cap. Diltz has opened the flood gates of his reservoirs, and it at present washing away the large bank of pay dirt which lies against the mine on the north side; and by artificial means of sluices and quicksilver is catching up the deposits of free gold which the earth at the mine and vicinity is known to contain in quantities to justify the outlay whenever a sufficient head of water can be obtained. During the period of removing the earth and obtaining gold therefrom, a double purpose is served. Large quantities of float gold bearing quartz is exposed, which are gathered up and piled for milling purposes. Our informant says free gold is frequently to be seen in the rock, as it is undergoing the process of water and being piled up.

COULTERVILLE.—Mr. Hunt, superintendent of the Compromise mine, came down yesterday with a small ball of retorted gold, about the size of a man's head. This mine is said to be constantly improving. The Martin & Walling is shut down, the pumps taken out of the shafte, all hands discharged and the work stopped. The mine has not been condemned as yet, for I understand they intend running a tunnel from Gentry's gulch. This tunnel will be of greater length than the Banderita tunnel. It will be a mammoth undertaking, but they are men of means and grit and nothing will deter them. Mr. Mast has taken a small force of men and commenced work on the Bower Cave mine. Mr. Douglass is still prosecuting work on the different mines of his company.

ENTERPRISE.—*Herald*, March 25: I learn that the Enterprise Co. has at last succeeded in striking its vein ore at a depth of about 400 ft. The tap was made by a tunnel, which has cost a large amount of outlay, money and labor both. The vein is about 3 ft thick, very hard, and tightly froze to each wall, which is also very hard. The prospects are fair for milling rock. The rock bears pretty much the same character it did 100 ft below the surface.

MONO.

BODIE NOTES.—A *Free Press*, March 22: *Free Press* reporter, in company with Martin Jones, visited the recent development in the 500 level of the Standard Con., on Wednesday. It is a big strong vein, from 5 to 7 ft wide, of very rich ore. It has been intersected by two crosscuts, 200 or 300 ft apart, and a drift is being run on the vein between them. The crosscut further south is about 200 ft north of the Bodie line. There is an upraise of 50 ft on the vein, and a drift north and south from the upraise. It shows rich ore everywhere, and the entire vein will mill up in the hundreds. The "suspicion" of the New York Mining Record that this ledge is the property of the Bulwer is quite without foundation. A much more reasonable suspicion is that it is the northern extension of the old Bruce vein of the Bodie, though found at a greater depth than at any other point.

NEVADA.

THE NEW MILL STARTED.—*Transcript*, March 25: The new mill of the Merrifield Co. started up Saturday with 10 stamps. It works to perfection. The timbers are already to put in for 10 more stamps in a few weeks, giving the mine 40 in all. Geo. Allan, of the Nevada foundry, is the gentleman who had the contract, and a good job has he done.

HEAVY FLOW OF WATER.—The water is coming into the workings of the Eureka No. 2 mine so rapidly that all the available power is required for pumping purposes. Hoisting of ore is interfered with temporarily as a result, but will be resumed as soon as there is less pumping to do. The ledge shows well in gold and another crushing will be made at an early day.

CHAPMAN'S RANCH.—Joseph Lawrence, John McLaren and several others who leased the Underwood & Murphy claim for a year, have about 250 tons of good ore on the dump. Six or seven men are at work in the mine. The Virginia City Co. have 180 tons on their dump, and are taking out more as fast as a force of eight men can do it. The ledge is a very large one. John Curry got $500 worth of specimens out of his mine last week. He is also extracting a liberal quantity of average ore. Mr. Green has bonded his claim to a San Francisco company that talks of erecting water-power hoisting works thereon. Mr. Cohen and Mr. Leahy will soon begin to work on their respective locations and continue it through the summer. It is likely that a mill will be erected in the vicinity of the above mines if they continue to show signs of permanency when more thoroughly developed. Judging from present indications it is going to make one of the best producing locations in the district.

STRUCK GRAVEL.—*Transcript*, 21: Work on the Shurtleff drift claim at Alta hill was resumed January 1st, and has ever since been pushed vigorously. The main tunnel is 800 ft to an upraise of 20 ft, beyond which it extends 450 ft further where a promising deposit of gravel has been encountered. The dirt prospects well. It is being taken out for a distance of 14 inches above bedrock, and a clean-up will be made as soon as there is a good supply on the dump.

WILL SOON CRUSH.—*Foothill Tidings*, 25: Underground work is going steadily on at the Ford & Mullen mine and good milling ore, as well as rich specimen rock, is constantly being hoisted to the surface. About 25 loads of rock now on the dump will be hauled to the custom mill and crushed as soon as the roads get in a passable condition. A few boxes of very rich specimens were deposited in Judd's vault lately.

THE ALPHA MINE CONTEST.—A contest is going on at present in the Superior Court between attachment creditors of the Alpha mine and a number of persons having mechanics' liens on that property. The law prefers the liens of laborers or material men to those of all persons who attach or incumber the realty after the labor is begun or material furnished. Hence this contest.

EAST EUREKA MINE.—Several of our monteyed men have interested themselves in the East Eureka (O'Connor) mine and the company will organize on Wednesday next.

PLACER.

NOTES.—Placer *Herald*, March 25: The tunnel in the Conrad mine is being extended to strike the pay chute that was struck in the main shaft. Wm. Hooper is working a ledge near Mrs. Kittler's hotel at Empire. It is supposed to be an extension of the old St. Lawrence. He has a strong vein, and his ore thus far has paid about $20 per ton. He is at present running a tunnel to drain the surface water. At the Crater mine some 12 or 15 men are at work steadily. At present they are sinking from the 700 to the 800-level. The Tremelling Bros.' mine, on Believue hill, continues to pay well. The last crushing, it is reported, went about $60 per ton. James Butts has opened up the old Hathaway lead, a short distance below Ophir. About a month ago he completed a 5-stamp steam mill, since which time he has been crushing steadily. The ore, though not of a high grade, is uniform and the ledge is quite large, being from 3 to 4 ft thick. In the opinion of some this will soon be the boss mine of Opbir district. New pumping, hoisting and crushing works are being erected on a mine near the old Eclipse. The Julian continues to run steadily, which is the best evidence of its prosperity.

THE IRON MINE.—Nevada *Transcript*, March 21: County Surveyor Hartwell returned a couple of days since from a professional trip to the vicinity of the iron mine at Hotaling, in Placer county, which is in an air line about 25 miles south of this city and less than 3 miles on the other side of Bear river which forms our county line in that direction. Three of the iron company's charcoal camps are on this side of the river and the fourth on the other. At each of these camps are 6 kilns having a capacity of 60 corde of wood apiece. They are all "charged" now, and will soon be burning. A large force of men are employed chopping more wood. At the mine masons are at work relining the furnace with fire brick, which will take 2 or 3 weeks; while a new shaft is being put down in a hitherto unprospected place with the best of results. A ledge of richer ore than ever before developed by the company has been found. As soon as the weather settles and the roads become passable the mine will be started up again in all departments and worked more extensively than ever before. It is impossible to transport the wood and charcoal as the roads are at present. Land in that section has doubled, and in some instances trebled in market value since the iron mine was started, on account of the demand for wood that has been created. The timber is mostly small oak, worth 50 cents a cord as it stands. The average yield per acre is 20 cords, and the ground when cleared is excellent for agricultural purposes. Most of the large trees, especially the pines, have fallen before the onslaught of the sawyers who some years ago paid their respect to that country.

SIERRA.

ITEMS.—Sierra *Tribune*, March 25: The snow is 7 ft deep in our streets, the deepest it has been for seven years. The last clean-up made by the Bald Mountain Extension company amounted to $1,200. The Bald Mountain company found it necessary to discharge some of their men last week, owing to the limited amount of timber on hand. Alleghany has been rather quiet this winter, but spring promises to bring livelier times to our neighbors. It is confidently expected that a number of new mining enterprises will be inaugurated in that vicinity next season. Will Hanly, who has had the Golden Star drift mine leased for the past year, is working his usual force in taking out pay gravel. The main tunnel has been run ahead some distance under his supervision, but no attempt has been made as yet to open out new ground.

BALD MOUNTAIN EXTENSION.—The Extension company encountered in the main tunnel last week what is supposed to be a slide or horse of lava. They then started a raise at a distance of about 40 ft ahead of the former one, and near the face of the tunnel, and in 15 ft struck fine looking gravel. This being 6 ft nearer than when tapped before, shows that the bedrock is pitching ahead of their main tunnel, and will be reached in a little distance further ahead if the present indications hold good.

THE SUFFOLK mining company at Wahoo has completed its dump yard, and will commence building as soon as possible. The mine continues to pay well. The main tunnel is still being pushed ahead.

TUOLUMNE.

PROSPECTS.—*Union Democrat*, March 25: Mining and agricultural prospects were never better in this county at this period of the year than now. An abundance of rain has fallen, the mountains are deeply covered with snow, which assures a good supply of water until late in the season. The past few days have been warm and genial, which if continuing will soon cover the hills and valleys with luxurious foliage. The great needful to put life into these hills is water, with it there is no telling what may not be accomplished. It is here forming a good basis for a prosperous season.

RUNNING.—*Independent*, March 25: Several mines have commenced running again since the severe cold weather has left us.

NEVADA.

WASHOE DISTRICT.

UNION CONSOLIDATED.—*Enterprise*, March 25: On the 2700-level, east crosscut No. 1 has been extended 27 ft, and north No. 3 12 ft. The joint Sierra Nevada east winze has been sunk and timbered 10 ft. On the 2500-level ore stoping out ore. The amount of ore extracted during the week from the 2500 and 2700 levels was 293 tons and 800 pounds.

OPHIR.—On the 2700-level the main south lateral drift has been connected with the joint California east crosscut. During the week 22 tons and 400 pounds of ore have been extracted from the croppings, and 70 tons and 1,560 pounds sent to the mills.

CONSOLIDATED VIRGINIA.—On the 2700-level the joint C. and C. east drift drill hole has been extended 80 ft.

CALIFORNIA.—On the 2700-level the joint C. and C. east drill hole has been extended 80 ft.

MEXICAN.—On the 2700-level the main north lateral drift has been extended 24 ft. The upraise from the main south lateral drift was extended 22 ft, the face showing fair milling ore. During the week 112 tons and 1,000 pounds of ore were extracted.

SIERRA NEVADA.—The winze in east crosscut No. 2 on the 2500-level has been sunk and timbered 11 ft; north drift No. 2 has been advanced 26 ft, and the main north lateral drift 32 ft.

YELLOW JACKET.—The pumps have been kept running at five strokes per minute since the last weekly report, as per agreement with the Bullion. The water in the mine this morning is 207 feet above the 2300-level station. During the first part of the week it rose very slow, as it was then filling the 2000-level (old works), which extends through the Crown Point, Belcher and Imperial mines. The past 24 hours the water rose 5 ft 0 inches.

ALTA.—The diamond drill is running in the west drift as a precaution against water. Rock hoisted, 460 cars; wood consumed, 37 cords; strokes made by the pump, 48,450.

BRISTOL DISTRICT.

MAYFLOWER.—Bristol *Times*, March 18: The Mayflower mine is still improving and showing up large bodies of high-grade rock. The chutes and ore houses full and enough ore in sight to keep the mill poundlug away for months.....Oilmer & Sallsbury will this week put a large working force on both the Tempest and Iron mines. Developments will be rapidly pushed ahead and every effort made to show up two of the largest bonanzas in the couutry.....The Noonday is still improving as work progresses, and the owners seem to be highly elated over the matter. This mine will in a short time become one of the standing mines of the district. It is said, that a large sum was offered for this property recently, but was refused.....The mill was shut down this week on account of a scarcity of water. The tanks are now all filled, and stamps will probably be dropped this coming week with a plentiful supply of water on hand, and everything in and about the mine and mill in the finest shape possible for a long and prosperous run.....It is now a settled fact that the Day company will start up the furnace here the 10th of April next. All the arrangements have been perfected for hauling of ore and the receiving of coal immediately. Men are already out in the woods burning, and it is expected that enough coal will be in on the 10th to keep the furnace running for 00 days. General Manager Henry Oodhue, of the Bristol S. M. Co., arrived last Monday from Minneapolis, Minn., by private conveyance. He is well pleased with what he has seen here, and particularly so indeed about the mill, where he has found everything in splendid shape and more to show for the money invested than he at first supposed.

CENTRAL DISTRICT.

ORE.—*Silver State*, March 22: One of Alex. Wise's teams arrived at the Winnemucca reduction works yesterday, with 14 tons of ore from the Keystone mine, in Central district.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, March 22: The work of cutting out for the new station still progresses favorably; when completed, it will be known as the fifth level. Everything is being got ready to commence running a drift to connect with the main winze on which sinking is being done from the fourth level. This winze is now down 125 ft on an incline and is very hard in the bottom, but 10 ft having been made since last report. The other shaft levels have the same appearance as last week. The levels above the adit are producing the usual quantity of ore, and the development between the seventh and eighth levels is still looking well; otherwise, the appearance of this section of the mine remains unchanged. Fifty-five tons of ore are being extracted and sent to the mills daily, both of which are running steadily. Mill No. 1 is running on Mount Diablo ore and on half the time only. Bullion shipments amounted to $13,618 74 for the week ending March 23d, and a total of $43,108.04 on March account to the same date.

MOUNT DIABLO.—The stopes above the east drift on the third level show no change. The stope below the north croscut from the west drift on the third level shows considerable improvement. The stope near the center of the mine below the second level is looking well and yielding considerable ore of very good grade. The stope above the second level of the west drift shows no change. The stope between the second and third levels on the winze from the west drift shows a larger ledge of better ore, and the prospect is good for the ore to open. The stope east of the shaft, first level, shows a narrower ledge than at the last report, but continues to yield first-class ore. The stopes west of the shaft on the first level continue to yield considerable $65 ore. Bullion was shipped as follows: March 18th, $7,048 47; March 21st, $6,766.53

EAST MOUNT DIABLO.—The work of crosscutting from the main east drift has commenced, and some good developments may be looked for at an early day.

GENERAL JACKSON.—The extraction of ore in this mine still continues, the stopes yielding fairly. The ore coming out is very clean, and of high grade.

EUREKA DISTRICT.

BULLION.—*Sentinel*, March 24: During the first half of the present month the Eureka Con. company shipped $67,027.25 in bullion. Fifty additional miners have been put to work in the Richmond mine during the past three weeks, nearly all of whom are $4-a-day men. Two loads of ore were shipped yesterday from the Eureka tunnel to the Eureka Con. works. Regular daily shipments will be made. We are informed that the Richmond company intends refining over a large amount of the lead bars they have on hand, as there is a sufficient quantity of silver remaining in them to pay a profit for working. It was reported on the street yesterday that the Richmond company intend shutting down the furnaces. We were unable to learn the cause for doing so, and came to the conclusion that there was no foundation for the rumor.

FAIRVIEW DISTRICT.

LEAD ORE.—Bristol *Times*, March 18: Bob Wilson and Andy Hear have 2 ft of heavy lead ore, assaying high in silver, in their claim in Fairview district, between 3 and 4 miles from here.

HIGHLAND DISTRICT.

RICH.—Pioche *Record*, March 18: Several very rich and handsome specimens have been brought into Pioche from the Last Chance mine of Highland district.

PIOCHE DISTRICT.

ANALYSIS OF RAYMOND & ELY BLACK ORE.—Pioche *Record*, March 18: Last July, 2,020 lbs of the Raymond & Ely black ore was shipped to the Frisco mining and smelting company of Frisco, Utah, to be analyzed and worked, and following is the result: The 2,020 lbs of ore went 24 8 ozs in lead, $2.97 ozs silver, 0.335 ozs gold. After this ore had been concentrated, there was 970 lbs, showing 48 3 ozs lead, 85.45 ozs silver, 0.452 ozs gold. The waste went 3.0 ozs lead, 64 88 ozs in silver, 0 291 ozs gold. Analysis: Lead, 16.60%; silver, 0 34%; zinc, 20 54%; iron, 3.52%; sulphur, 23.41%; aluminum, 7%; lime, a trace; silica, 20.00%.

ARIZONA.

SANTA CATARINA.—*Star*, March 21: A rich vein of high grade red oxides of copper has been struck in the tunnel on the Apache mine. The indications are the best for reaching a large body of ore soon in the tunnel. Also fine green carbonates are showing up in the shaft at 80 ft deep that average 22% copper. Every foot sunk on the mine shows the most encouraging results, and demonstrates this to be one among the most promising copper properties of southern Arizona. The machinery is being rapidly placed in position. The sawmill will soon be ready for operation to cut out lumber for timbers for the smelter, and the company is a strong one, and is sparing no pains nor expense to place their mines on a producing basis. They have every show for a rich bullion product to speedily repay them for their outlay.

IDAHO.

GALENA.—Wood River *Miner*, March 18: Two ft of solid galena ore was struck in the Jay Gould mine yesterday, which will run above 200 ounces in silver to the ton.

ITEMS.—Mr. Bunting, of the Northwestern Forwarding Co., Blackfoot, was in town this week, looking up the forwarding business. W. Thompson, foreman of the Little Wood River M. and S. Co.'s property, came in from Muldoon on Tuesday, and reports the new bridge over Little Wood river completed. It is 144 ft in length, 16 ft wide, 10 ft above low-water mark, and rests on four substantial piers. There are three other bridges yet to build on the new road to Muldoon. The gang of men who have been constructing the bridge are now at Muldoon, getting things in readiness preparatory to start up work as soon as the weather permits.

THE CHARLES DICKENS.—Yankee Fork *Herald*, March 25: The south vein of the Charles Dickens is improving as work progresses. Large quantities of nuggets of pure metal are being taken out. Some of these are large chunks, and very beautiful, and are about three-fourths silver and one-fourth gold. The quartz of the entire vein (nearly 2 ft) is of wonderful richness. Such a sight of mineral has never before been witnessed in even the Yankee Fork country. The ore is literally crammed with metal of every imaginable shape. The face of the drift where the ledge is so rich is about 300 ft from the surface. To-day the Charles Dickens makes the best showing, probably, of any vein of like size in the country, and if it continues much further in its present richness it will make the mine worth many millions. The rich streak has been followed a distance of 200 ft, and is getting better and stronger all the time. If any camp in the United States can beat Yankee Fork for rich and plentiful ores, we would like to hear of it.

MONTANA.

ORE.—*Inter-Mountain*, March 20: The ore now being extracted from the Morning Star is improving in quality, the assays to-day being $58, $99 and $128 per ton. Eight tons per day is now the regular output. The St. Lawrence has recently shipped 14 tons of 50% copper ore, and has 75 tons of first and second-class ore on the dump. The mine is developing into a valuable property. Two hundred tons of copper are on the dump of the Modoc Extension, and the owners of the property are making frequent shipments. Placer mining in the vicinity of Butte will soon recommence. Operations on the Salvage have been temporarily suspended. The Bell mine shipped 00 tons of ore to the smelter yesterday. McDermott & Co. are opening up a valuable property in the Liquidator. The development of the Shonbar is already returning a handsome profit. Energetic work continues in the new three-compartment shaft of the Magna Charta. The Laura mine in the Berker district has been bonded to Eastern parties for $40,000. Much dissatisfaction is expressed as to the operation of the machinery recently placed in position in the Broadway mill at Silver Star.

OREGON.

MINING NOTES.—*Sentinel*, March 18: Cowan & Gale, of Birdseye creek, picked up a $12 nugget last week, besides several smaller ones. The late warm rain has given the Sterling company an abundance of water, and gravel is being moved fast. De Selles & Co., at Waldo, are running their elevator successfully, and will make a good clean-up soon. The Waldo hydraulic company, Winer & Simpson, are piping day and night, and moving a vast quantity of dirt. This is one of the big paying claims of southern Oregon. Oin Len is running two pipes on his claim on Little Applegate in good paying ground, and one pipe on his Palmer creek claim. Fifteen Chinese began work this week on the ditch from Palmer creek to the Red hills. It will be nearly eight miles in length, and is being built by Gin Lin. The Applegate gravel company are going to put in an elevator soon, and feel confident that it will work well. Blue Gravel and English companies on Galice are crowding things with full heads of water. All the miners in the Willow Springs and Foot's creek camps are busy again. Tom Kahler, of the Fort Lane diggings, has been cleaning bedrock with good success. Chapple, of the Star gulch mine, is getting off a large amount of gravel, and has plenty of water. W. Q. Brown, of Oakland, has purchased two more copper and nickel claims near Canyonville; price not stated. The Star gulch company made a partial clean-up this week of 38 ounces. Schumpf is still working on his tunnel at Willow Springs, the ledge showing plenty of good quartz.

NEW MEXICO.

MOGOLLONS.—Cor. Socorro *Miner*, March 18: The Cooney mine is being worked, and taking out some very rich ore from the lower tunnel, and the company will likely have a smelter working their ore some time this summer. W. R. Myers, who has charge of the M. & S. gold mine in the Great Western lode, who owns one-third of the M. & S., has let a 65-ft contract for a working shaft 390 ft, and is driving work night and day, so as to develop the property as soon as possible, and then to get machinery to work the mine. It is certainly one of the richest mines that has ever been discovered in this part of the Territory, and we are proud to say that the parties who are interested, G. O. Manchester, of Topeka, Kas., H. P. Strong, of Beloit, Wis., and W. R. Myers, of the Mogollons, are men who will be of much interest to this camp, and we wish them success. Chicago parties, who have lately bought the Parker & Potter mine, expect to have their mill here within sixty days. A great deal of work is now being done all over this camp, with good results.

TURQUESA.—Cor. *New Mexican*, March 24: Our district is getting new life into it. All the miners are at work, and rich strikes of mineral are taking place every few days. Property is changing hands, and development is being pushed forward on many new claims. Mr. H. J. Chise, of Las Vegas, is in our camp, and is much pleased with the prospects of the district. He has bought the Ark and the Monarch claims, and has let contracts on them for development. This district has as high grade ore as can be found in any district in New Mexico. Work on the Bonanza No. 3 is progressing as fast as men can do it. They are working day and night, and will soon be in readiness to take out ore with their machinery. They have partly cleaned out some old workings, done by the ancients, and it shows up a strong vein of very good looking mineral. I hear they have struck a body of rich mineral in the Pacific lode; also in the Great Western. All owners of mines will soon be able to have their ores reduced. With two smelters and one concentrator will come active development in this district.

BODIE DEVELOPMENT.—An important development has been made in the joint winze between Noonday and North Noonday. The mines are 200 ft. below the 512 level. In a vein 20 ft. wide 6 ft. of ore has been cut, which will average over $100 per ton. The metal is in the shape of gold and silver sulphurets, differing essentially from the ore in the upper levels. In many respects it resembles the top of the Con. Virginia ore body. Assays from portions range from $1,000 to $2,000 per ton. Superintendents William Irwin, Martin Jones, Thomas Buckley, R. K. Colcord, H. C. Osborne, of the *Free Press*, and others, visited the mine to-day, and by all the development is regarded as very important, considering its depth and the position of the South End district.

Chinese Immigration.

Full Text of the Bill as Paesed by both Houses.

Following is the fnll text of the bill regulating Chinese immigration as it passed the House. No amendments were made in the latter body, it he ing accepted precisely as it came from the Senate. The only changee made by the Senate were in the enacting clause, extending the time of going into effect from 60 to 90 days, end the addition of sections 16 and 17, the former prohihiting the naturalizetion of Chinese, and the latter defining the words "Chinese lahorers."

WHEREAS, In the opinion of the Government of the United Statee the coming of Chinese lahorers to this country endangere the good order of certain localities within the territory thereof; therefore,

Be it enacted, etc., That from and after the expiration of 90 daye next after the passege of this act, and nntil the expiration of 20 years next after the passage of this act, the coming of Chinese laborers to the United States he, and the same is hereby euepended; and during such suspension it shall not he lawful for any Chinese lahorer to come, or, having so come after the expiration of said 90 daye, to remain within the United States.

Sec. 2. That any master of any vessel of whatever nationality, who shall on such vessel hring within the jurisdiction of the United States any Chinese lahorer from any foreign port or place, ehall he deemed guilty of a misdemeenor, and on conviction thereof sball he punished hy a fine of $500 for each and every such Chineee laborer so hronght, and may be also imprisoned for a term not exceeding one year.

Sec. 3. That the two foregoing sections sball not apply to Chinese lahorers who were in the United States on the 17th day of November, 1880, or who shall have come into the same hefore the expiration of ninety days next after the passage of this act, and who shall produce to such master hefore going on hoard such vessel, and shall prodnce to the Collector of the Port in the United States at which such vessel shall arrive, the evidence hereinafter in this act required of his heing one of the lahorere in this section mentioned; nor shall the two foregoing sections apply to the case of any master whose vessel, being hound to a port not within the United States, shall come within the jurisdiction of the United States hy reason of being in dietress or in stress of weather.

Sec. 4. That in order to tbe faithful execution of Articles I and II of the treaty between the United States and the Empire of China, ratified July 19, 1881, in case any Chinese residing in the United States on the 17th day of Novemher, 1880, or who shall have come into the seme hefore the expiration of ninety days next after the passage of this act, shall depart therefrom, they shall, before such departure, cause themselves to be duly registered at a cnstom house in the United States, and produce to the Collector of the district at which they shall seek to re-enter the United Statee the certificate of such regietration and the Consular certificate in thie act provided for.

Sec. 5. That, in order to the faithful execution of Articles I and II of the treaty hefore in this act mentioned, every Chinese, of any class or occupation whatever, who may he entitled hy said treaty and tbis act to come within the United States, except euch ae resided in the United States on the 17th day of November, 1880, or who shall have come within the United States within 90 daye next after the passage of this act, shall ohtain the permission of the Chinese government in each case, to he evidenced hy a passport issued hy eaid government, which passport ehall he in the Englieh languge, or accompanied hy a translation into English, showing such permission, witb the name of the permitted person in his proper signature, and which passport shall state the name, title, or official rank, if any, the age, hight and all phyeical peculiarities, former or present occnpation or profession, and place of residence in China of the person to whom the paeeport ie iseued, and that euch person ie entitled hy the treaty in this act mentioned to come within the United Statee. Thie paseport and the identity of the pereon named in it shall, hefore euch person goee on hoard any veeeel, to proceed to the United States, he *vised* hy the indoreement of the diplomatic repreeentative of the United States in the empire of China, or of the conenlar repreeentative of the United Statee at the port or place from which the pereon named in the passport ie ahout to depart. Such paesport ehall he *prima facie* evidence of the facte set forth therein, and ehall he produced to the Collector of Customs of the port in the dietrict in the United Statee at which the pereon named therein ehall arrive, and afterward prodnced to the proper anthoritiee of the United Statee whenever lawfully demanded.

Sec. 6. That the Secretary of the Treasury ehall forthwith cause to he prepared and kept at the custom houees of the United Statee proper hooke, in euch form ae he shall prescribe, for the registration of Chineee who ehall he entitled, under the proviеione of this act, to the privilege of cntering and reeiding in the United Statee. Entry ehall be made in euch hooke of the name of every euch Chineee, and hie proper eignature; hie place of hirth—giving town or district—date of hirth, last place of residence hefore coming to the United Statee, place of residence in the United States, if any, name and reeidencee of hie parente, if any, date and place of arrival in the United Statee, employment or bueiness, hight, and physical marks or pecnliarities by which he may be identified. Every applicant for registration shall make oath to the facte stated in his registry, which oath shall be recorded in the hook of registry. Collectore of Cnetoms and their deputies shall have power to administer and certify to all oaths under this act.

Sec. 7. That it shall he the duty of the Collector of Customs to issue to every Chinese entitled to registry, and regietered hy him, at the time of regietration, a certificate, in such form ae the Secretary of the Treasury may preecribe, setting forth all the facts contained in snch regietration, and the data of identification prescribed in Section 6 of this act, which certificate shall he signed hy the Collector of Cnstoms of the district, or bie depnty, and attested hy his seal of office, dated the day of ite issue, and upon which ehall be written the proper signature of the person registered. A minute of the issnance of such certificate and date of issue ehall be mede in the book of regietry on the margin of the regietration. The certificate so issned to a Chinese ehall be *prima facie* evidence of the facts therein stated.

Sec. 8. That any person who sball knowingly make a false etatement nnder oath in the registration of any Chinese under the provisions of this act shall he deemed guilty of perjury; and any person who shall regieter at more than one custom house in the United States, or procure more than one certificate of registration, or alter or snhstitute any name for the name written on such certificate, or forge any such certificate, or utter any forged or fraudulent certificate, or falsely personate any person named in any such certificate, shall he deemed guilty of a misdemeanor; and upon conviction of any offense mentioned in this section, the guilty person shall be fined in a sum not exceeding $1,000, and imprisoned in a penitentiary for a term not more tban five yeare.

Sec. 9. That the maeter of any vessel arriving in the United States from any foreign place hall, at the same time he delivers a manifeet of his cargo, and if there he no cargo, then at the time of making a report of the entry of the vessel pursuant to law, in addition to the other matters required to he reported, and before landing, or permitting to land, any Chinese paseengers, deliver and report to the Collector of Cnstoms of the district in which such veseel shell have arrived a sparate list of all Chinese passengers taken on board his vessel at any foreign port or place, and all such passengere on hoard the vessel at that time. Such list shall show the name of such passengers (and if accredited officere of the Chinese government traveling on the husiness of that government, with a note of such fact), and the names and other particnlars, as shown by the respective passporte and certificates, hy the master in the manner reqnired hy law in relation to the manifest of the cargo. Any refusal or neglect of the master to comply with the provisione of this section shall incur the same penalties and forfeitures as are provided for a refusal or neglect to report and deliver a manifest of the cargo.

Sec. 10. That before any Chinese passengers are landed from any such vessel, the Collector, or his deputy, shall proceed to examine such paseengers, comparing the passports and certificatee, ae the case may he, with the list and with the passengers, and no passenger shall he allowed to land in the United States from eucb vessel in violation of law.

Sec. 11. That every veesel whose master shall knowingly violate any of the provisions of this act shall he deemed forfeited to the United States, and shall be liable to eeizure and condemnation in any district of the United Statee into which such vessel may enter or in which ehe may he fonnd.

Sec. 12. That if any consular officer, on examination of the claims and identity of any Chinese proposing to depart to the United States, shall he satisfied that such person eeeks so to do in violation of this act, he shall refuse to certify to the right of such person to so depart; and every Collector of Cnstoms shall refuse to allow any Chinese to enter the United States if he shall diecover that such entry ie unlawful nnder this act.

Sec. 13. That any pereon who ehall knowingly hring into, or canee to he hronght into, or shall aid or ahet the hringing or coming into the United Statee hy land, or who shall land, or aid or ahet the landing in the United Statee frcm any veseel of any Chineee not authorized hy law to enter the United Statee, ehall be deemed guilty of a misdemeanor, and ehall, for each person so brought or aided to come into the United Statee, or eo landed, he fined in the sum of $100, and imprisoned for a term not exceeding one year.

Sec. 14. That no Chineee ehall be permitted to enter the United States hy land without producing to the proper officer of cnetome the certificate herein required of Chineee eeeking to land from a veseel; and any Chineee who ehall knowingly come into the United Statee contrary to the provieione of this act, ehall he deemed guilty of a misdemeanor, and on conviction thereof, ehall be pnnished hy a fine not exceeding $100, or hy imprieonment not exceeding one year, or hoth eaid puniehments, in the discretion of the court; and any Chineee nnlawfully entering within the United States, or who ehall have unlawfully entered the United Statee in any way, either hy land or hy water, ehall he removed therefrom hy the Collector of Custome of any collection district in which euch Chineee may he found, at the cost of the United States, under euch regulatione as the Secretary of the Treasnry may preecribe.

Sec. 15. That thie act ehall not apply to diplomatic and other officers of the Chinese government traveling upon the businese of that government, whose credentiale in the usual form shall he taken as equivalent to the passport in this act mentioned, and shall exempt them and their body and household servants from the provisione of this act as to other Chinese.

Sec. 16. That hereafter no State court or court of the United States ehall admit Chinese to citizenship, and all laws in conflict with this act are herehy repealed.

Sec. 17. The words "Chinese lahorers," wherever used in tbis act, ehall he construed to mean hoth skilled and unskilled lahorers, and Chinese employed in mining.

Ores of Lead.

Lead occurs as an occasional constituent of a very large number of the ores of other metals, hut the minerals containing this metal as an essential constituent, in sufficiently large quantity, and occnrring in sufficient abundance to constitute them ores of lead, are exceedingly limited in numher, a single ore, viz., "galena," furnishing by far the greater proportion of thie metal; while tbe plumhiferoue minerals or oree almost always contain more or less eilver, and are accordingly described as argentiferous or non-argentiferous, according as the proportion of silver is snfficient or otherwise to pay for its extraction. The minerals containing lead, and occnrring in sufficient ahundance to he classed as oree of thie metal, may he placed under two heads: First, sulphides of lead, and second, oxycompounds of lead, ae the carhonates, sulphates, phosphates, oxides, etc., of lead. Bnt, besides these two classes, there are a number of minerale which, though not of sufficient importance to rank as ores of lead, yet are more or less ahnndant, and often associated with galena, so thet they frequently come under the notice of the metallurgist, and call for a hrief description of their qualities in tnis place.

At the head of the first division of lead ores consisting of tne sulpbides of lead, occurs "galena," plnmhic snlphide, or as it is sometimes called "hlue leed," which ie hy far the most important and ahundant ore of lead, containing, when pure, 86.61% of lead, with 13.39% of sulphnr; and which is further a most important sonrce of silver, since silver, as also gold, are probably invariahle constituents of all galenas, though in some casee their quantity may he exceedingly small. Galena forme a lead-grey mineral having a streak of the eame color. It possesses a metallic lnstre, a hardness of ahout 2.5, and a fine, coarsely-granular, or fihrons fracture; and it hae been generally considered that the more finely-grannlar, or, as they are called, steely varietiee of the ore, are more highly argentiferons than the coarse, lerge-grained epecimens; and though a comparison of the galenae of a certain locality will frequently confirm this view, yet, as a general rule applicahle to the comparison of a ooarse-grained galena from one district with a steely specimen from another, the rule is douhtless erroneous. Galena occurs crystallized in the cnbic syetem, chiefly as cnhes and octahedra, and it has a very perfect cubic cleavage. The specific gravity of this ore ranges between 7.25 and 7.7. When heated hefore the hlow-pipe thie mineral decrepitetes, then fuses, and finally yields on charcoal a glohnle of metallic lead.

Galena is very widely distributed over tbe glohe, occurring in almost every country, and both in the older and more recent geological formations. Thus it forme veins in the Devonian formation "killas" of Cornwall and Devon, in the carhoniferous or mountain limestones of Cumherland, Derhyshire, Flintshire, and the North of England, which formation yields the largest proportion of the British lead ores; while in Cardiganshire, Shropshire, Montgomeryshire, the United Statee, etc., it occurs in the lower silnrian rocks. At Freiherg, again, it occure in gneiss; in the county Wicklow, in granite; while Sweden afforde this mineral in a matrix of granular limestone. In addition to these localitiee, galena aleo occnre in Scotland—in the Lead-hille of Lanarkehire,—the Iele of Man, largely in Spain, Germany, and Northern Italy, and in emaller proportione in France and Belginm; it ie aleo found in Siheria, Algeria, and Auetralia, numerone parts of North and Sonth America, etc.

Ae above etated, the pure eulphide containe 86.61% of lead; hnt galena is very often impregnated with small quantitiee of other hodies, as eilver, gold, hlende, iron-pyrites, mispickel, enlphide of antimony, fahlore, ferroue carhonate, calamine, quartz, dolomite or pearl-epar, harytes, fluor-epar, calc-spar, etc., whilet, more rarely, it aleo containe manganeee, anthracite, etc. The preeence of theee eubetances neceeearily reducee the percentage of metal in the ore, eo that the ores emelted in England contain on the average from 70% to 80% of lead; but at Freiherg ores containing only 40% of lead are emelted; while, if other metals, ae copper, eilver, or gold, are preeent in profitahle proportions, the lead in the oree ie then extracted and paid for, althongh its amonnt may not exceed 15%. The first-mentioned associates of galena, viz., silver and gold, are of conetant occurrence in it, prohably exieting ae enlphides. The gold ie moet freqnently, however, in very small proportione, while silver occurs in very varied proportione, hut rarely exceeding 1%, while an ore containing 0.25%, or ahout 82 czs. of eilver per ton, ie considered a very rich ore; and oree aesaying only ahout 0.005% of eilver, and which yield a lead containing not more than 2 ozs. silver per ton of metal, can be profitably treated hy the Pattinson process for the extraction of the silver. Besides the ahove-mentioned associates of galena, the rarer minerals containing lead, such as plumbic carbonate, chromate, phosphate, sulphate and oxide, are freqnently associated with it.

Plnmbic eulphide also occure in combination with sulphide of antimony in the minerals Jamesonite, Boulangerite, Geocronite, and with cuproue eulphide in addition it constitutes the mineral bonrnonite.

Of the second class of lead ores or oxycompounds of lead enumerated ahove, the most important and ahundant is the plumhic carhonate, cerussite, or white-lead ore, a transparent or tranelucent mineral, of a white or grayish color, with an occasional bluish tinge, possessing an adamantine or vitreoue luster, with a colorless streak, and a hardness of from 3 to 3.5. It occurs in fihrous, compact, or earthy masses, ae also in crystals of the trimetric or prismatio eystem. This ore is found in lodee, ae also in beds in limestone, usually associated with galena; and at Aix-la-Chapelle it is raised in considerahle quantity, ae also in the vicinity of Santander, in Spain. It likewise occure in Cornwall, Devon, Yorkshire, the Lead-hille of Scotland, county Wicklow, Westphalia, France, etc.

Plumhic sulphate, or Anglesite, occure as a white, gray, greenish, and sometimes bluish, translucent, or opaque mineral, having an adamantine luster, with a hardness of from 2.5 to 3. It occurs in cavities, also in lodes crystallized in the trimetric or prismatic syetem, and ie often associated with galena and plumhic carhonate, at Anglesey, in Scotland, Cumherland, Derhyehire, Hartz, Spain, Germany, France and the United States. This compound, combined with cuprons carhonate, etc., constitntes Caledonite, and a similar mineral is known as Lanarkite.

Pyromorphite or plumhic pbosphate varies in color hetween green, yellow and hrown, and hes a white or yellowieh streak. It nsually contains plumhic chloride as well as phosphate, and certain varieties contain also plumhic arseniate. In Derhyshire, thie mineral is known as "linnets" from its peculiar color. The mineral also occurs in the Lead-hills of Scotland, in Cumberland, Durham, Yorkehire, Cornwall, Wicklow, Bohemia, Sexony, Hartz, France, the United States, etc.

Mimetesite or plumhic arseniate ie an analogous mineral to the leet, hut containe arsenio acid, in lieu of phosphoric acid, as an essential constituent. It forme a pale yellow or brown mineral, with a white streak, occurring at Redruth and other mines of Cornwall; elso in Devonshire, Cumhsrland, Saxony, France, Sweden, South America, etc.

The ores of lead found near the surface often helong to the second clase or oxycompounds of lead, and are a result of the decomposition and oxidation of galena.

Besides these sulphur and oxidized ores of lead, nnmerous minerals containing lead in large proportion occur, hut not in sufficient abundance to constitute them ores of lead; of such are plumbic chloride, mendipite, plumhic chromate, etc.

A Southern California Mining Sale.

During the pest eight days one of the most important salee of mining propsrty ever effected in eontbern California took place, the property sold being a two-thirde interest in the "Rattler" and "Bonanza King" group of mines in Providence Mountain district, hy Messrs. Boyer, Drew, Hasson and Osborne, through Mr. Gillette, to two New York corporations, receiving therefor, respectively, $100,000 for the "Rattler" interest, and $325,000 for the "Bonanza King" interest. Messrs. Boyer, Drew, Hasson and Oshorne retain a one-third interest in hoth mines. These gentlemen went to San Francisco thie week to make the final eettlements of the sale. Theee mines have only lately come into notice, hut hid fair to eoon gain a prominent poeition among the noted rich minee of the Pacific coaet. Providence Mountain dietrict is ahont 100 milee northeaet of Colton, in a direct line, hut hy the wegon road, ie very near 200 milos. There ie plenty of wood and good water, and everything ie convenient for the working of mille and the eetabliehment of a camp. It is the intention of the corporatione to have a 10-stamp quartz mill erected and in working order within 60 daye. There is now ahont 2,000 tone of ore on the dnmpe which will average $150 per ton, all of which ore hae heen taken out of the minee while heing prospected, from the ehafts, drifte, etc. No etoping whatever has heen done eo far, and thoneande of tone of rich ore are in sight. Ahout $60,000 worth of ore has been ehipped from the minee, which hae paid all the working expeneee so far. When we eay this ore wae hanled 200 milee in eacks on wagone, and then ehipped from this point to San Francieco hy rail to he worked, and a splendid return received over and ahove all expensee, some idea may he formed of the richneee of the high-grade ore.

The Atlantic & Pacific railroad ie eurveyed within eight milee of the minee, and when completed will furnieh eaey acceee to the camp. The partiee now in charge of the minee intend eoon putting a large force of men at work, and expect a camp of 500 or 1,000 minere will he eetahliehed there ineide the next eix months.—*Colton Semi-Tropic.*

The Engineer.

Railways as Civilizers.

It would be an impossible thing for a newspaper article to give even a faint conception of the results of the building of railroads. The last four decades have marked an era in human progress in this country in this respect equaled by nothing except the discovery of the art of printing.

Bring to the front the strongest emphasis every argument that can be urged against railroads, and yet the inestimable benefits to the country and to mankind outweigh them all. As a civilizer the railroad has no equal. Wildernesses disappear as if by magic, and the long lines of towns and villages stretching across the continent are the results of railroads. They advertise their lands, give accurate descriptions of them and distribute millions of circulars all over the old world, thus attracting a hardy immigration hither who convert the savage wilds of the West into blooming gardens. Suppose they do add wealth to their coffers, so does Uncle Sam by this increase of taxable wealth. It has not been many years since the maps, pored over by the school-boy, portrayed, sharply outlined, a vast, arid tract of country in the western plains, known as the Great American desert. Railroads penetrated it, people followed the railroads, irrigation was employed, and the man of to-day looks in vain for the terrible desert of his school days. The vast treasure caves of Colorado, Nevada and the West would still be sealed by the forbidding obstacles nature has interposed to guard her glittering stores, were it not for the magic influence of the railway lines which now rush over the deserts and plains and penetrate the vast and silent canyons of every mountain chain, unlocking the rock-bound caskets and bestowing the hidden treasures upon the hardy and enterprising seekers.

But the story is not yet half told. The limit of development is still far beyond human ken. There are depths yet unsounded, realms yet unexplored, which will in time respond to the shriek of the locomotive, and unfold untold riches to the explorer. So far civilization, development, wealth and refinement have been the results of railway extension into hitherto unknown regions to an extent that must overbalance the evils that many complain of. Every good is mixed somewhat with evil, but our country can well afford to put up with the crookedness of syndicates which have accomplished such wonderful work as the young West to-day presents.—*Exchange.*

TUNNELING HISTORIC GROUND.—The tunnel on the line of the New York, Ontario and Western railroad, through the Palisades, and connecting Weehawken to New Durham, touches historic ground at its eastern approach. Exactly over this spot is where Alexander Hamilton and Aaron Burr fought that famous duel that robbed the nation of its great statesman. Here also Burr fought John B. Church, and here were witnessed the following affairs of "honor": The duels between DeWitt Clinton and John Swartwout, Com. Perry and Cap. Heath, George J. Eacker and Philip Hamilton, Benjamin Price and Maj. Green, Wm. J. Graham and Mr. Barton, of Philadelphia, together with several contests of less importance. An effort is making in New Jersey to have a monument erected at this point to perpetuate the stories of the murders there perpetrated and the memory of those who participated in the bloody combats.

ELECTRIC LIGHT IN LONDON.—The present condition of the electric light in London is: Streets are now being lighted with it at one-fourth of the price of gas; incandescent lamps can be introduced into every room of any house so soon as the mains are laid; there can be a separate meter to each house; the lamps can be separately lighted and put out by turning a cock; if one light goes out no other one is affected; the subdivision is so complete that there is no glare, and yet a room with incandescent lamps is far more brightly lighted than with an equal number of gas lamps, and an equal amount of candle-power produced by electricity is cheaper than an equal amount produced by gas. In addition, the electric light has no odor, it does not vitiate or heat the air, nor does it, like gas, tarnish paint and decoration.—*Truth.*

A STONE BRIDGE, to be built at Minneapolis, Minn., bids fair to become one of the notable structures of the world. According to an exchange it will consist of 16 80-foot spans and four 100-foot spans, and, including the shore pieces, will have a total length of 1,900 ft. It will support two railway tracks at a height of 60 ft. above the water, and will run diagonally across the river below St. Anthony's Falls. The cost is estimated at nearly $500,000. This will be a remarkable bridge, truly; but so far as length of span is concerned, the Cabin John bridge, or Union Arch, near Washington, D. C., exceeds it, being a granite arch of 220 ft. span, the longest stone arch in existence. The bridge is 101 ft. high and 20 ft. wide.

TELEGRAPH MILEAGE OF THE WORLD.—A French statistician has calculated that if all the telegraph wires at present laid were tacked on end to end they would reach 46 times round the world. Belgium has a greater telegraph mileage in proportion to its superficial area than any country in Europe. Switzerland comes second and Great Britain third. Russia has the least.

Useful Information.

A Varnish for Ships, etc.

M. Ricarde-Seaver prepares a varnish for ships, etc., by the following process: One hundred lbs. of sulphate of copper are dissolved in hot water, and to the solution 30 lbs. of glucose are added. A saturated solution of 80 lbs. of commercial carbonate of potash is prepared and added in small portions to the first solution, till the quantity of pure alkali thus added has reached 30 lbs. (The carbonate of potash may be substituted by carbonate of soda, or another alkaline base, but, in general, potash is to be preferred.) The above mixture is heated to 212° Fahr., and kept at that temperature until, by the formation of precipitate, the color of the solution changes from greenish blue to yellowish red. The solution is then taken away from the fire, and the precipitate, which consists of a hydrated suboxide and an anhydrous suboxide of copper, is collected on a filter. It is then washed, and the water with which it has been washed is added to the filtered solution, which is again heated to 212° Fahr., and the precipitate now formed is filtered, washed and added to the first precipitate. The precipitates are now dried carefully, in order not to drive away the water of hydration, and is then mixed in an appropriate vessel with 2 lbs. of a solution of phenic acid, 75%. It is left to stand for about five hours, or until the color of the top of the mixture has changed from yellow to green, then heated not above 190° Fahr., until it becomes thick enough to be mixed with oil. The required quantity of linseed or other oil is then added. The sulphates of the alkali used, which are the result of the above reaction, can be utilized after crystallization from the residue water.—*Boston Jour. Com.*

A NEW, CHEAP AND SUPERIOR GAS.—According to the London *Times*, a great improvement in the manufacture of gas has just been introduced at Watford by Messrs. Rogers Bros., whose workshops and premises are now lighted with the new gas, which gives a pure white and brilliant light of about five times the illuminating power of ordinary coal gas. By the new process no smoke or smell is emitted, and no "scrubbing" or lime purifying is requisite. There is no danger in the manufacture, as only non-explosive oils are used. The new apparatus can be adapted to any existing coal gas works, and all ordinary pipes, gas-holders, etc., can be utilized. A sufficient quantity of gas of great luminosity and purity can be manufactured in a few hours to keep a large mansion supplied for a week at 1s. 6d. per thousand cubic ft., which is about one-third the price of the Watford town gas. A burner passing 1 cubic ft. per hour of this new gas, according to the photometric test, gives as much light as a burner passing 5 cubic ft. of the ordinary coal gas; and as it contains no sulphuretted hydrogen or carbonic acid, plants, pictures, hooks and gilding do not in any way suffer from its contact.

A SCHOOL FOR BRAKEMEN.—The Erie is fitting up one of the buildings of the new car shops at Hornellsville with an ingenious apparatus, with which their brakemen will be taught the management of the air-brake. The instruction is afforded by a set of air-pipes, equal in length to what is required for a passenger train of 12 cars. This is laid at a hight of about six inches from the floor, and three air-brake cylinders are connected with the pipes. The air-pump is fastened against the wall, and is operated by steam, which is carried through a pipe from a locomotive in the round-house. The model is perfect in all points, and its workings can be illustrated as clearly as if the brakes were attached to a train. It is believed that by familiarizing the brakemen with the air-brake, many accidents, due to the ignorance of its workings, may be averted.—*Buffalo Express.*

SOME REPRESENTATIVE AMERICANS.—The theory that the human race will not be able to maintain a high order of physical development on this continent did not receive much encouragement at a recent social gathering of "tall men" in New York city. The "Titans," a society to which only gentlemen of position and of a stature not below 6 ft. 2 inches are eligible, now numbers about 100 members, largely representative of our oldest and best known American families. Seventy-three Titans sat down together at the recent annual dinner of the society. The tallest measured 6 ft. 6 inches. There were a dozen generals and colonels among them, as many prominent physicians, and a long list of distinguished lawyers and business men.

DOUBLE HYBRID WORM-PROOF COTTON.—Mr. L. C. White, of Jasper, Jasper county, Texas, claims that after 20 years of study and experiment he has fully succeeded in producing a worm-proof cotton. Not only is the plant worm-proof, but it produces, he says, more and larger bolls to the stalk than any other cotton, matures earlier and has a better staple and finer lint than any other cotton grown. He wants the Government to pay him $1,000,000 for the seed and for his theory. If his "double-hybrid," absolutely worm-proof cotton is all he claims for it, he should be able to make $1,000,000 selling seed to planters much quicker than he is likely to get such a sum from the Department of Agriculture.

SPONTANEOUS COMBUSTION.—A New York artist relates a case of spontaneous combustion in his studio which is chiefly singular because the fire did not result more seriously. He had been staining his wainscoting with a preparation of Prussian blue, black oil, and turpentine, and threw the cloth which he had used on the lounge, first wrapping it in a piece of burlap. During the night the cloth lighted spontaneously, burned through the burlap and the covering of the lounge, and destroyed one of the hard wood arms. These cases of spontaneous combustion are not rare, and, while it is not generally admitted, there is no doubt that the burning of many a furniture factory can be traced to the careless disposal of rags which are used in staining and finishing. They are often seen smoking in an ordinary basket and slowly burn away. A sheet-iron box to put them in would do away with any danger, and avoid the occurrence of "many mysterious fires" by probable incendiaries.

SEASON FOR FELLING TIMBER.—I have been watching the wood department of the paper to see if any one has anything to say with regard to the proper season of the year to cut timber; but as yet I have noticed nothing upon this subject. My experience and that of those who have preceded me, for the rule has been handed down for at least three generations, is that the very best season for felling timber is in the old of the moon in February. Timber cut at that season will outlast that which is cut in other months. Further, I will state that my experience is that timber cut in June has the shortest life of any. I shall be glad to hear from other readers on this same subject.—*Blacksmith and Wheelwright.*

PRINTERS' INK FROM COTTON WASTE.—M. Bastand subjects cotton waste, in a closed vessel, to the action of bisulphate of carbon, or any other liquid having great affinity for oil and capable of evaporating at a lower temperature. Bisulphate of carbon is, however, to be preferred on account of its cheapness. It should completely saturate the cotton contained in the vessel, and run off with the oil and grease of the waste into a suitable receptacle, in which the mixture is subjected to the action of heat. The bisulphate of carbon is evaporated and condensed, to be used over again, and the oil and grease serve admirably for printers' ink, while the cotton waste, deprived of its grease, is as useful as before.

REMEDY FOR CLICKING.—The best remedy that I have ever found for horses clicking or striking their hind shoes against the forward ones is to put on high toe-calks and low heels on the hind shoes. If my brother smiths are incredulous concerning this remedy, I advise them to try it and be convinced.—*Blacksmith.*

STEAM PIPES RUSTING INSIDE.—It is often found that steam pipes and fittings corrode badly on the inside, so much so that leaks are sometimes formed. This action is generally attributed to the presence in the steam of much free oxygen and carbonic acid and sometimes sulphites—derived from sulphides present in the water.

Good Health.

"Cold Catching."

It is noteworthy as a curious yet easily explicable fact that few persons take cold who are not either self-consciously careful, or fearful of the consequences of exposure. If the attention be wholly diverted from the existence of danger by some supreme concentration of thought, as, for example, when escaping from a house on fire or plunging into cold water to save life—the effects of "chill" are seldom experienced. This alone should serve to suggest that the influence exerted by cold falls on the nervous system. The immediate effects of a displacement of blood from the surface, and its determination to the internal organs, are not, as was once supposed, sufficient to produce the sort of congestion that issues in inflammation. If it were so, an inflammatory condition would be the common characteristic of our bodily state. When the vascular system is healthy, and that part of the nervous apparatus by which the caliber of the vessels is controlled performs its proper functions normally, any disturbance of equilibrium in the circulatory system which may have been produced by external cold, will be quickly adjusted. It is, therefore, on the state of the nervous system that everything depends, and it is, as we have said, on the nervous system the stress of a "chill" falls. Consciousness is one element in the production of a *cold*, and when that is wanting the phenomenon is not very likely to ensue.

It is in this way that persons who do not cultivate the fear of cold-catching are not, as a rule, subject to this infliction. This is one reason why the habit of wrapping up tends to create a morbid susceptibility. The mind, by its fear-begetting precaution, keeps the nervous system on the alert for impressions of cold, and the centers are, so to say, panic-stricken when even a slight sensation occurs. Cold applied to the surface, even in the form of a gentle current of air somewhat lower in temperature than the skin, will produce the "feeling" of "chill." Conversely a thought will often give rise to the "feeling" of cold applied to the surface—for example, of "cold water running down the back." Many of the sensations of cold or heat which are experienced by the hypersensitive have no external cause. They are purely ideational in their mode of origination, and ideal in fact.—*Lancet.*

Ventilation and Fresh Air.

Fireside comforts are almost inseparable from the idea of an open fireplace, and from a hygienic standpoint, too, the old-fashioned chimney, or an open grate, is far superior to a closed stove. But it should not be forgotten, writes Dr. Oswald in the *Popular Science Monthly*, that the operation of the chimney-draft alone is insufficient to correct the vitiated air of a small room; it merely creates an outward current. An open window completes the renovating process; in cold weather a few minutes are sufficient to revitalize the indoor atmosphere for a couple of hours. Only the blindest prejudice can deny the pleasant effect of such an influx of life-air; it revives the azotized lungs as a draft of cool water refreshes the parched palate. Colds are never caught in that way. The very name is a misleading misnomer; inflection or influenza would be the right word. Long exposure to a freezing storm, in certain cases, induces a pure pleuritic fever—a very rare affection, and entirely different from the only too familiar catarrh.

What we call a cold is caused by the influence of impure air, or dust, on the sensitive tissue of our respiratory organs; subsequent exposure to the open air merely intimates the crisis of the disorder—the discharge of the accumulated mucous through the nose or throat. Fresh air is here only the proximate cause, as in toothache, or in those paroxysms of retching following upon the first respiration of a half drowned person. If we postpone the crisis by persistently avoiding the open air, the unrespirable matter, instead of being discharged, will be deposited in the tissue of the lungs in the form of tubercles.

STOMACH DIGESTION.—After thorough mastication, each mouthful of food is in turn swallowed, being drawn down into the stomach by the muscles of the œsophagus, not simply dropping into that organ through the open tube, as many people suppose, the œsophagus being always closed, except that portion which is occupied by the food in its passage to the stomach. Shortly after the food has reached that organ, its mucous membrane assumes a rosy appearance, and then may be seen, oozing from its surface, the gastric juice in tiny drops, like perspiration on the skin. The secretion increases rapidly, and begins at once its specific action on the albuminous elements in the food. It may occur that the gastric secretion has been excited before the food has been swallowed, in which case there is no delay whatever in the commencement of gastric digestion. All this has been learned from observations in the curious and well known case of St. Martin, whose stomach, by a wound, was opened to view, and was continued in that condition for a number of years. If the stomach contains a large amount of fluid, that must first be absorbed before the digestive process begins. Hence the propriety of using but little liquid while eating.

IMPORTANT MEDICAL GAIN.—The one great medical discovery that will serve to distinguish the year 1881, is that of Pasteur, the great French chemist, of a method of mitigating the malignity of the virus of certain fatal contagious diseases among domestic animals, which diseases have hitherto defied all curative treatment. Pasteur has demonstrated by these brilliant and convincing experiments that he has succeeded in effectually controlling these virulent diseases. He has been able, by subjecting the virus of the disease to certain processes, to so modify it, that when introduced into the bodies of healthy animals—as in vaccinating the human subject—it produces but a temporary indisposition, and thereafter renders the inoculated animal effectively proof against the disease. The enormous money value of this great discovery to the agriculturists of Europe, who have been great losers by the ravages of disease among their flocks and herds, is admitted. But still more valuable results may, and probably will, flow from it by the extension of the discoverer's method to the protection of the human subject against many malignant and fatal diseases that afflict the human kind.

ANTI FAT DIET.—Dr. George Johnson, in the *Practitioner*, proposes the following as an anti-fat diet: May eat—Lean mutton and beef, veal and lamb, soups not thickened, beef tea and broth, poultry, game, fish and eggs, bread in moderation, greens, oresses, lettuce, etc., green peas, cabbage, cauliflower, onions, fresh fruit without sugar. May not eat—Fat meat, bacon or ham, butter, cream, sugar, potatoes, carrots, parsnips, rice, sago, tapioca, macaroni, custard, pastry and puddings, sweet cakes. May drink—Tea, coffee, cocoa from nibs, with milk but no sugar, dry wines in moderation, brandy, whisky and gin in moderation without sugar, light bitter beer, soda and seltzer water. May not drink—Milk, except sparingly, porter and stout, sweet ales, sweet wines. As a rule alcoholic liquors should be taken sparingly and never without food.

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SAN FRANCISCO:

Saturday Morning, April 1, 1882.

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Passing Events.

From all quarters we now hear reports of a prosperous outlook for the coming season. The miners in this State hope to do well this year, the only thing now feared being an adverse decision in the debris case. Judge Temple has not yet rendered any decision, and of course everything remains in a state of doubt.

The people of the Pacific coast have been in a fever of expectation during the past week on the subject of the Chinese bill. As we write (Thursday afternoon), the matter is still pending. Meantime many Chinese are coming and many more are getting ready to come.

Spring is now at hand, and the prospectors are preparing for active work in such regions as are not covered with snow. Before many weeks the hills in all the newer mining districts in the country will be visited by men in search of new mines. We hope to chronicle many new discoveries.

THE piers for the Northern Pacific Railroad bridge across Lewis Fork (or Snake river), near its mouth, will be eight in number and will cost $250,000. The entire superstructure will be of the best quality of iron, and constructed in the most substantial manner. It will cost not far from $500,000.

NICKEL AND COBALT.—The second paper on this subject, to follow the one published last week, will appear in the next number of the PRESS.

Prospectors and Miners.

This month will see thousands of prospectors starting out for their summer's work in the mountain ranges of the Pacific coast. In some regions, where snow lies long, they will be late in beginning; but in all the camps preparations for the summer's campaign will soon begin. It will not be long before reports of rich regions will come in, and we shall be pleased to chronicle the numerous finds that will be made.

But it does not by any means follow that, because new districts will be found, they will be much better than old ones. True, the first men in a new district get a chance to take up a lot of ground; but that is no reason men should drop claims they have to rush off after new ones that may be no better.

If a miner has a pretty good prospect in hand, be can seldom do better than by holding on to it and proving it up. There is no need, when a man has a good claim, of rushing off to every new camp discovered, and keeping up a wild goose chase all summer. Too many men do that. Let every man be a prospector until he finds a claim. Then turn miner and do something with it. If the claim proves bad, or can be sold, then turn prospector again. But a man who is always a prospector and never a miner seldom makes much money.

Then, again, there are fields of exploration close at hand, which may be better than those farther off and more talked about. The old saying of "Distance lends enchantment," is never better verified than in the case of the prospector.

He imagines, if in Arizona, that there are better chances for prospectors up in Idaho or Montana and an easier country to work in. If in Montana or Idaho, he thinks, perhaps, Arizona or New Mexico offer better fields for his energies. If in California, he thinks that State played out, but away from it he thinks "old California a pretty good place to tie to after all." In fact, while he swears by the claim he happens to have in hand at the time, and thinks it promises better than any he ever had, he also thinks some other country better than the one he is in.

The influence of habit makes the old prospector restive. A few times over the same ground gives it a played-out look to him. He sighs for new regions, new surroundings and a change of base. He eagerly listens to all that is told about newly discovered regions and swallows stories that sober reasoning and thought tell him cannot be true.

Men will drop claims and leave for new districts to take up claims not worth half as much, and defend their judgment by sticking to the last location till they can hold on no longer. The fascination of a new camp is one that the prospector finds it hard to resist; and when half a dozen men leave a camp for a new one, half of those left begin to think about it too.

Of course, no amount of advice would accomplish much. Each man knows what he wants better than any other man. Prospectors will keep on roaming and changing till time is no more. But perhaps some who have been prospectors will rest content when once mining the claims they have found, and accumulate some of the money which too often falls to the lot of those who do no work, but profit by the nomadic habits of those who find the claims.

ALASKA MINES.—Advices from Harrisburg to the 17th of March say: The steamship, *Eureka*, arrived here this morning and landed a large quantity of freight, and then steamed over to Douglas island and landed a quartz mill for Mr. Treadwell. He has also a large gang of men at work getting things cleared away and making ready for putting up the mill. We have had a considerable fall of snow this last month. There is at present about 30 ft. of snow up on the mountains. It has been blowing a gale from the north for the last week, and the weather is quite cold at present. Fuller has struck the ledge in his mine after running a tunnel. He had cut in on the ledge 11 ft., and had not found the opposite wall. The ore looks well and shows free gold all through. Everybody in camp is feeling jubilant over the rich prospects. The only thing we are in need of now to make this one of the most prosperous mining camps on the Pacific coast is civil government, law and justice, so that capital will have some protection. If Congress thinks it can't afford it we would suggest that the Territory be given back to the Russians.

YOSEMITE VALLEY.—The Yosemite Valley Commission met on Monday afternoon, and decided to purchase the Glacier Point trail, and make it free to the traveling public. A communication has been received stating there is nearly five ft. of snow in the valley, and that the wind has made severe havoc among the trees in one spot, just immediately under Glacier point. Large pines and cedars, from two to four ft. in diameter, have been broken off like pipe-stems; others were uprooted. Large limbs have been wrenched off and hurled into and across the road. Destructive as this wind was, it has opened up one clear spot for the better view of the grand wall of Glacier point, leaving timber and firewood for the valley's use. The mail carrier reports from 12 to 15 ft. of snow on the mountains, so that the falls will be exceeding grand this spring and summer.

Production of the Precious Metals.

An Abstract of the Census Monograph on the Bullion Output of the Country.

Second Paper.

But the impossibility of assigning to other channels the due proportion of the outflow through them; the fact that no record is made of the value of the gold bullion and dust sent through the mails; that no reliable allowance can be made for the undervaluation of gold dust and unassayed bullion by consignors, amounting in many cases to from 5% to 10%; that there is no satisfactory means of checking the re-shipments which are twice or more times recorded, combine to create a large margin which can hardly be definitely accounted for in making the total estimates. The looseness in the distinction observed between silver bullion and dore metal allows a considerable portion of the gold contents of dore bullion to escape the record, the whole value of such bars often being credited to silver; while, on the other hand, of course no account is taken of the value of the silver alloyed with placer dust and gold bullion, though this is a less important source of error. Notwithstanding these palpable but unavoidable defects in the system, much credit is due Mr. Valentine for the painstaking care with which he has prepared his annual estimates.

The third system is one which, were it practicable to pursue into complete details, would lead to results more satisfactory than could be obtained in any other way. This may be termed the direct method. It would consist, if properly carried out, in obtaining from each bullion producer a statement of the quota contributed. The aggregate of the details thus reached would represent the actual total product of the country, and would, moreover, segregate it according to districts. In the census work conducted by the U. S. Geological Survey, the plan indicated has been followed to as minute detail as it was possible to extend it with the means at command. No attempt had ever been previously made which aimed at securing individual returns throughout the whole United States with the same degree of thoroughness; though the successful adoption of the direct method by Mr. A. Del Mar, in his investigation of the silver product of Nevada in 1876, showed the advantages of the plan. But even with all the time and care expended by the experts engaged in collecting the statistics, it was found to be impracticable to do more than obtain returns from the larger producers. In some instances well-based and careful estimates were submitted by the experts, covering aggregates of a large number of small mines, for whole districts. In other cases, and more especially so in portions of the country where placer mining on a small scale furnished a large proportion of the yield, reliance had to be placed on extraneous data.

The chief obstacles encountered in the collection of bullion statistics directly from the producers were:

First. The wide extent of the field to be covered and the vast number of mines to be reported upon, even were the mines located in easily accessible places, the wide range of territory over which they are scattered would render the labor of personally visiting each productive district a tedious matter. But when it is considered that they are for the most part to be found in rugged, mountainous tracts, often at high altitudes, and, when destitute of railroad communication, to be reached only by stage or on horseback, some idea may be gathered of the amount of work involved.

Second. The fact that a considerable yield is derived from small mines, the product from each of which, however insignificant in itself, goes to form part of an important aggregate, and should not be neglected.

Third. The reluctance of some mine owners and superintendents to give a full account of their operations, notwithstanding the strictly confidential manner in which these individual statements have been treated. On explanation of the purposes for which the statistics were collected, such objections were in most cases overruled, however, and invariably great courtesy was personally manifested.

Fourth. The fact that in a large majority of cases no systematic accounts are kept by mine owners, who were often unable to state from memory the precise output of their properties for a period which had elapsed some time before the inquiry was made.

Fifth. Many mines having changed hands during the census year, it was frequently impossible to obtain from the present holders a statement of the operations conducted prior to the change in ownership, or to communicate with the former owners, if they had removed.

Sixth. When in the case of mines worked during only a portion of the census year, or during a season limited by the weather, water supply, or other causes, operations had been suspended at the time the district was visited by the examining expert, it was often impracticable to communicate with the only persons able to supply information.

Seventh. The variation in the fiscal year of the incorporated companies makes it a matter of much difficulty to reduce the returns to a different period from that for which the books are kept.

With means still less adequate than were lately at command, the census authorities in 1870 found it impossible to trace the bullion product of the country at that time. The best results reached by the depoty marshals in certain instances hardly amounted to a moiety of the actual product, as known through other sources of information. In the case of the census of 1880, even with greatly increased facilities, there were many gaps in the testimony which had to be filled out by estimates derived from other data than those collected directly by the experts. Where such estimates have been applied in the tabulation, they have been indicated by an asterisk (*). In all cases a careful scrutiny has been exercised in the selection and comprison of material. It is believed, in view of the more extended and fuller details accessible, as compared with previous researches of the same nature, that the results arrived at in this compilation are as close an approximation to absolute accuracy as it is possible to attain without a far greater expenditure of money and time than the subject demands.

In compiling the material at hand this following system was adopted: The returns given in the individual mine schedules were first abstracted and grouped into aggregates for districts. Information as to the operations of the different establishments being in many cases confidential, publication of the results begins in the census report with the district exhibits, which, in the following pages, have been condensed into tables for counties, and finally into abstracts for whole States and Territories. Where a marked discrepancy existed between the schedule returns and other reliable data, the necessary additions were entered and the fact that they were estimates indicated. It is hardly necessary to remark that the schedules would show deficiencies rather than an excess as compared with correlative data. At the same time the schedules of reduction works were examined, and furnished a valuable check upon the figures derived from the mine reports. In some instances the yield was quoted in ounces of fine metal, as is customary in localities where the ore is reduced by smelting; in others, in ounces of crude bullion, as in the case of placer gold; in still others, in dollars, calculated from the assay value of the bullion; and more rarely, in dollars, representing the net proceeds after deducting the discount upon silver and other charges. In order to present the whole in harmonious shape, it became necessary to reduce these various denominations to a uniform standard. That adopted is the Troy ounce of fine metal and its assay value in United States money. In the following tables, however, the bullion product is quoted in dollars, disregarding the weights.

Classification of Mines.

Mines of the precious metals are grouped under two comprehensive heads: deep mines and placer mines. The former are workings in primary deposits, in which the ore usually, though not invariably, occurs in a vein, and while the earlier operations in mines of this class may begin at or near the out-crop of the vein, the tendency is always downward. The leading varieties of deep mines are:

1. Mines of free gold, or gold alloyed with a small proportion of silver.
2. Mines of silver ores, containing only traces of gold.
3. Mines yielding dore bullion from milling ores containing both gold and silver in appreciable quantities.
4. Mines yielding base bullion from smelting ores in which the precious metals are associated with larger quantities of lead, copper, etc.

All these divisions shade imperceptibly into each other.

Placer or gravel mines are workings in secondary or fragmentary gold deposits, including gravels and sands, and are either surface or shallow workings. The leading types are:

1. Hydraulic mines.
2. Dry washings.
3. Booming and shovel-sluicing.
4. River mines.
5. Pocket miner.
6. Drift mines.
7. Branch mines.
8. Black sand littoral deposits.

In the tables of production the classification under these two main heads is observed.

Classification of Reduction Works.

In some of the following tables a distinction is made between the production as shown by the different reduction works, which, like the mines, are divided into two principal classes. These are, first, amalgamating mills, including—

1. Gold-quartz mills.
2. Mills in which silver ore is treated in the raw state.
3. Mills in which roasting is practiced before amalgamation.
4. Concentration works.
5. Chlorination and leaching establishments.
6. Arastras.

The second class includes the several varieties of smelting works in which the production of base bullion, matte or speiss is a preliminary step toward the final extraction of the precious metals.

(TO BE CONTINUED.)

FEARS have been freely expressed, says the Eureka *Sentinel*, that our two representative mines were pinching out. The figures will not bear out such an assumption. During January and February the Richmond shipped $205,279 in bullion, and during the first 11 days of the present month the Eureka Con. turned out $51,128.51. Considering the comparatively small number of men employed, it is one of the best showings ever yet made.

Mammoths.

(Continued from Page 209.)

fonnd mammoth, was at that time generally discredited.

The Moet Celebrated Discnvery

Was made in 1799. A Tungusian fisherman named Schnmakoff was exploring along the coast of the frozen ocean for ivory. He was near the month of the river Lena, in latitnde 70°, when he discovered in a huge block of ice a dark, mis-shapen mees whose natnre he could not clearly make out, as it was too deeply imbedded. But it had two great tusks of ivory which he greatly coveted, hnt could not then detach. Cold seasons followed, and it was not till five years later, in 1804, that he reached the spot again. Then he foand that the ice bank had melted, and the mammoth, for snch the great object proved to he, had fallen ont by ite own weight. He cut off the tnsks, which he took on a long journey south, to Jakutsh, and sold to an ivory dealer. It so happened that a few yeare later, 1808, an English traveler named Adams, visiting that city, saw the tusks and heard the etory of thsir finding. He orgaaized a psrty and retnrned with the Tnngusian to the place where the latter had fonnd the great beast. But it was no longer complete; for in the years which had intervened since the first discovery, the nomadic trihe, Jakntski, had been feeding their dogs upon the flssh, which they cnt off for the pnrpose. Also the wild beasts of the region, the white bears, wolves and foxes, had come in for their share of the food, and had dragged the bones aronnd and trampled the hair into the snrface earth. Adame collected with care this skeleton, which, although mainly cleaned of flesh, lacked but one fore-foot of being complete. He also took the skin of one side of the great creature, with about forty pounde of the loag black hair and undercoating of reddish wool which covered it. At Jakutsk he was so fortnnate as to secure, by purchase from the ivory dealer the two great tusks. The next year he transported the whole a weary jonrney of 7,000 miles to St. Petersburg, where the precious relic was purchased for 8,000 roubles hy the Emperor Alexander and placed in the musenm hall of the Imperial Academy of Sciences. The great animal still stands there monnted—a hnge skeleton, with skin over parts of ite head and one leg, and the hair still adhering in places.

The Mnsenm of Natural History in Paris and the Royal College of Surgeons in London were each presented with portions of the skin. Such is, in hrief, the etory of

The Siberian Hairy Mammoth,

(Or the "St. Petersburg Mammsth") as it is often called. This specimen, with the two others mentioned first as having been found in the same conntry, stands nnique in the whole history of fossil remains in the fact of the preservation of the soft parts of tbe animal—its flesh and sinews—in connection with the bones. Snch an occnrrence is phenomenal in the most extreme degres, and only its most complete authentication, by the preservation nf the specimen itself, has secnred acceptance and belief. To account for thie phenomenon, geologists biased more or less by the known hehits of living elephants, which are restricted to tropical regions, have hed reconrse to the hypothesis of a

Cnmplete Change nf Temperature,

Either snddenly brought about by a great geological cataclysm, or due to the secnlar changes of land and sea level, which bave ever been at work in the past as at the present dey. Unquestionably, the intense and possibly increased cold of that northern region has heen the canse of the preservation of theee remains. But the heavy coating of hair and wool, so different from that of its modern elephent congeners, indicetes clearly that the mammoth was adapted for life in these cold regions, where it roamed in herds and was a permanent resident. The fact that the rhinoceros found here should also have heen clothed with thick hair, while its modern relative in tropical regions ie as naked-skinned as the elephant, is an additional and powerfal argument for the belief that the climate of northern Siberia was of its present winter severity at the time that these great pachyderms lived there. The fact seems to have been generally overlooked that an animal, organized as the teeth of the mammoth plainly indicate, to gain its subsistence from the braachee or woody twigs of trees, is thereby rendered independent on the proceseion of seesons which regulate the development of leeves or fruits. The food of such an animal is perennial, to be obtained ae easily during the months when snow covered the whole plain, as during the shorter period when the surface of the country was green with its transient summer coating of ehrnbs, moss and lichens. Any animal clothed like our mammoth, or like the reindeer of Greenland, with a natnral garment cepable of

Resieting the Rigors of an Arctic Winter,

Would have fonnd permanent pasturage on thsse inclement and desolate plains which lie across all Siberia between the 60th parallel and the perpetnally frozen ehores of the icy sea. Forests of hardy shrubs still cover the frozen soil of this portion of Siheria, eo the qneetion of food for eo migbty an animal really preeente no difficnltiee whatever. Had onr knowledge of the mammoth, indeed, been restricted, ae in the caee of all other extinct animale, to ite bonee and teeth, the analogy of theee witb the modern elephant would have made it a hazardone epecnlation to have conceived, *a priori*, that it had a clothing so different as to euit it to this aorthern residence. The actual fiading has settled this difficnlty, and shown ue that here, as in many other cases, the proven facts nf natnre oatstrip the ventures of reasoniag.

The pecnliar

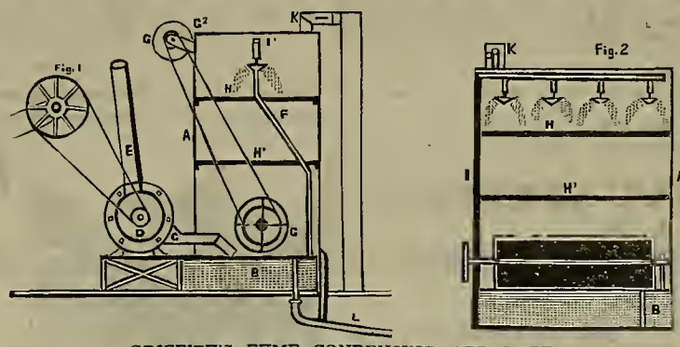
Physical and Climatic Cnnditinns

Of the region where these frozen mammoths have been fouad give ns a not difficult or improhable solntion to their strange entombing. It will he remembered that the country is, in its general aspect, a broad plain, more than 1,000 miles wide, traversed hy great rivers which rise in the higher and warmer regions more than 20° of latitude to the south. In the early spring these rivers in their upper oonrses at the south, send down a freshet of water, which, ae it reachss the lower conntry, finde the bsd of the stream still bound in solid ice. Over this ice, over the banks of the river, the waters, pressed on from behind, force their way, and, spreading over the entire coantry on either side, change it to an innndated plair, nntil limited to the north by a line where the water steedily freezss, and fnrther progress is stayed. Along this line, waving with the conformation of the surface and oscillating with the period of the year, the wandering mammoths were expressly liehle to he caught aad entrapped in the delnge of freezing water. Thns frozen in, and entirely enveloped with a thick covering of ice, some have, as we have seen, remained covered until the present day and their flesh conseqnently preserved. That hy far the greater number of the great herds shonld have left us only their bones, teeth and tusks, is furthermore in fnll accordance with the fact that most of them died an ordinary death, with the climate at a temperature which was insufficient to preserve their carcasses. Those which were overwhelmed and entangled in ice were the exceptions.

In Europe, at least, the mammoth seems to have been

Cneval With Early Man.

In the bone caverns of England, France and Germany, those great charnel houses of early animal life, there are found scoree and hundreds



GRIFFITH'S FUME CONDENSING APPARATUS.

of hones of the mammoth commingled with those of the rhinoceros, hippopotamus, aurochs, cavern bear, and other animale now quite extinct, or living in other continents. It is clear that the mammoths did not themselves crawl into tbese caves, often with an exceedingly narrow opening, and die there; nor do the surroundings often allow the idea that they were brought there hy a flood of waters. In many cases the abundant marks of teeth and the gnawing of the bones sbow that tbey were dragged to tbe cave by wild beasts that made it their den and fed upon tbem. But in a few epecial cases the cavern has been the home of early man, who brought there the remains of animals which they bad hunted and killed.

In These Caves

There are found, with those of other animels, maay bones of the mammoth, and of these, evory long hone has been split open to obtain the marrow from the central cavity.

Mingled with these hones are fonnd here and there the flint knives and stone hatchets which served as utensils at these early feasts. On a tusk of a mammoth found in one of the caves of Dordogne, in eonthern France, was a rude engraving of the animal itself, scratched long ages ago with the sharp point of a flint. These troglodytes are now no more. They and their giant neighbor, the mammoth, bave perished, one after the other, in the lapse of infinite ages, hy those changes of circumstances in the organic and inorganic world which are always in progress. No less tban 30 species of these fossil elephants—mammothe and mastodons—have been found in various parts of the globe, under nearly every parallel of latitude and in every continent except Australia. As an individnal form, the mammoth is nniquely interesting, as showing the maximum of size to whioh terrestrial animal life has ever attained. So large an organism reqnired an abundant and constant supply of food. This it obtained, as its teeth have shown us and as we see from its congeners, the elepbants of the present day, from the tender branches of trees and the succnlent stems of shrubs.

A Specimen nf the Allied Mastodon,

Dug up many yeare ago in the neighborhood of Newhnry, on the Hudson, contained between the ribe, in the region of the stomach, nearly a bushel of cbewed twige, the last meal of the great arbivore. Like modern elephants, the mammotha and mastodons liked to visit marehy places and poole of etanding water, to cool their hodies aad free themselves from ineects. It was in their visits to these swamps that many of them met their death hy sinking so deeply in the mire that it bscame impossible for them to extricate themselves. Thns engulfed, their bony framework, bared hy decomposition of the surrounding flssh, sank still deeper, and there, beyond reach of further disintegration, they have remained through maay ages to the present day.

Several skeletons have thus been found burried in clay or in peat marshes. Generally, however, only isolated honss are found—a thigh-hone, a shoulder-blade, some vertebras, a jaw or teeth. Thsre is hardly a county, not of prairie land nor yet absolutely mountainous, in ths entire Union where some mammoth or mastodon remaias have not been found. The soil of the Pacific slope contains them in abundance; so all the States hordering on the Missouri and Mississippi rivers for their entire length. The valley of the Ohio was followed by them in its entire lsngth, so the Susquehana, the St. Lawrence and the Hudson. Big Bone Lick, in Kentncky, was a favorite resort for them, and there, within an area of less than 100 acres, have been found huried in the mnd the hones of several hundred individnels.

These facts show that the mammoth end the closely allied

Mastodnn Once Rnamed in Large Herde

Over our whole country at a psriod eo recent that little chsngs in the configuration of the surface has since occurred. These great herds of elephants have forever disappeared from the surfacs of our soil, while their early compaaions, the huffalo, the elk and the deer, still remain, though in steadily decreasing nnmhers. It is hardly donhtful that they were coeval with our red hrethren, although the number of traditions referriag to them is not large.

In exhuming, in Missouri, a fine, perfect skeleton of the mastodon which now stands in the halls of the British Museum, Dr. Koch fonnd, directly under ite shoulder-blade a etone arrow-h ead, which, from its position, wae apparently shot into the thick skin of the great animal while alive, perhaps in a simultaneous attack of aborigines, who, by ahundant wounds, caused its death.

In the State of Wisconsin, as is well known, are meny large mounds of earth, some of them covering several acres, and huilt in imitation of the forms of various animals. One of these in the neighborhood of Racine, called "Elephant Mound," has the well-defined outline of a mammoth or mastodon with his long trunk. The likeness is unmistakable, and there can hardly be a reasonable donbt that the great animal himself was present se a model and inspired the construction.

The general intelligence of the early settlers of our country hae prevented many

Wild and Superstitinus Stories

Abont these great bones from heing rife in America. No one mistakes them for the hones of giants, nor attrihutes them to the Behemoth of Joh or to the ship-wreck of Noah'e ark. Not so in Europe. There, for many centuries, the bones of these harmlese proboscidians have figured largely in tbe demonology and gigantology which have had an accredited place in the lore and the literature of the people. Many an old work in bleck letter told in voluminous latin pages the long story "*De Gigantibus et eorum Reliquiis*," "*De dentibus gigantorum*," "*De gigantium osssibus*," and all the other marvels of this wonderous race.

For the information contained herein we are indehted to Prof. Henry A. Ward, who made at his natnral science establishment in Rochester, N. Y., the restoration of the mammoth now on exhihition in this city at tbe Mercantile Library Hall, Bnsh street. Strenuous efforts are now being made hy the Academy of Sciences to raise sufficient money to purchase the whole collection and keep it on this coast. It ie greatly to he hoped that the Academy will succeed, as it would be a pity to see the unique collection depart from our shores. Over 5000 people a day have visited the hall since the Ward collection hae been on exhibition. The main interest hae centered on the mammoth, and we take pleasure in giving an engraving of it, eo that those in the interior nnable to eee the epecimen, may have eome idea of its appearance. Ite great eize may be imagined by comparing it with the figuree of men and horse in the engraving. The height is 16 feet, and length, inclnding forword curve of tuake, 26 feet.

Apparatus for Condensing Fumes.

Gases from metallargical fumes have generally heen condensed and the smoke therefrom pnrified by passing them throngh a spray of water, and through water droppiag from partitions placed on the condenser, as shown in Johnson's arrangement, patented Feb. 18, 1873. It has also been customary to inject the gases from such furneces into a vessel containing weter, or other liquid, by means of a wheel placsd in said reeervoir, as shown in the patent of R. C. Bockiag, of July 3, 1866.

A. E. Griffiths, of Philadelphia, has recently devised an apparatus for condensing fnmes, to be used in connection with fnrnaces, retorts, etc. The arrangement is an improvement on a patent granted to Mr. Griffithe March 27, 1866. The vapors are condensed and metellio particles saved.

Figure 1 of the engraving is partly in section, and shows a reservoir for the reception of gasee arising from metallurgic furnaces and fumes arising from retorts and kettles, in whioh chemicels are treated and tallow and other substances rendered, a fan for drawing the gasee and fumes from the furnaces and forcing them into the condensing reservoir, pipes through which the gasss and fumes pass to and from the fan, a water bath within the reservoir, a rotating aire gauze, screen for agitating the gases and fumes, and pipes for conductng the water to and from the reservoir. Figure 2 is a transverse sectional elevation, ehowing the devices for producing a ehower hath for the gases and fnmes within the reservoir.

In constructing devices of this character, there is provided a reservoir, or what may he termed a condensing tank, *A*, in the lower portion of which there is maintained a bath of water or other liquid, *B*, into which any particlss of metal which may be carried into it from a metallnrgic furnace by the escaping gases, fall, and from which they may be removed from time to time through a men-hole or other snitable opsning. Into this bath the gases from the furnaces and the fnmes from other devices are also carried through a pipe, *C*, the outer end of which is attached to and in communication with a fan, *D*. This fan is driven hy any prime mover by means of belts, as shown, or in any other convenient manner.

The arrangement of the fan, *D*, and of the whole apparatus, with reference to the furnace, retort or kettle in connection with which it ie to be used, is such that the pipe, *E*, which leads the gases and fumes to it, may be attached to the top of the furnace, so that the fan may take away snch gases and fumes and force them through a pipe, *C*, into the hath of water in the reservoir or condenser, *A*.

For the purpose of agitating the gases and vapore ae they arise from the beth, there is placed in the reservoir, *A*, a rotating screen, *G*, which is driven by a pulley placed upon its outer end, around which passes a belt which extends to and over a pulley, G^1, placed upon a shaft journaled in bearings attached to the reservoir, *A*, upon which last-named shaft is a pulley, G^2, which may be driven by a pulley on the shaft of the fan, or by any other suitable means.

Above the rotating screen there are two or more wire-gauze diaphragms, *HH*, which extend across the reservoir, and are for the purpose of subdividing the gas and vapors as they ascend, so that they may he condensed hy being brought in contact with shower baths of water introduced through a pipe, *I*, the outer end of which may be connected to a pump or other source of supply. This pipe extends across the reservoir, within the same, and is provided with a series of outlets, I^1, which conduct water into a trough, pipe or a series of cups suspended from the reservoir, and from these water falls in the form of a shower hath upon the diaphragm, *H*, through which it passes through H^1, and falls into the lower portion of the reservoir, *A*, in doing which a portion of it comes in contact with the revolving screen, *G*, by which means it is sprayed among the ascending gases and fumes which are, to a great extent, condensed thereby and hy the falling water hefore it reaches the screen.

The wire gauze diaphragms have the effect of retarding the ascent of the gases and vapors, as well as to comminute the falling water and thus to hring the two bodies into more iutimate contact with each other, and so facilitate the condensation of the former.

For the purposs of conducting off the gases and vapors, should any remain uncondensed, there is placed upon the upper portion of the reservoir, *A*, so ae to communicate with the interior thereof, a pipe, *K*, in which is a valve; this, when desired, permits whatever may remain uncondensed in said reservoir to escape into the chimney of the furnace, or it may he conducted to the furnace and caused to pess through the incandescent fuel upon its grate, and thus he prevented from producing auy injurious effect upon the vegetation of the surrounding country, and from annoying or injuring the puhlic.

As a means of preventing the water from rising too high in the reservoir, *A*, there is provided an overflow pipe, *L*, which rises to the required distance therein, or is attached to the outside thereof, at the requisite hight, eo thet when the water reaches the open mouth thereof, it will flow out, and thus the requisite amount of water is maintained therein, while it is prevented from rising too high.

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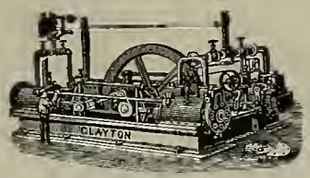

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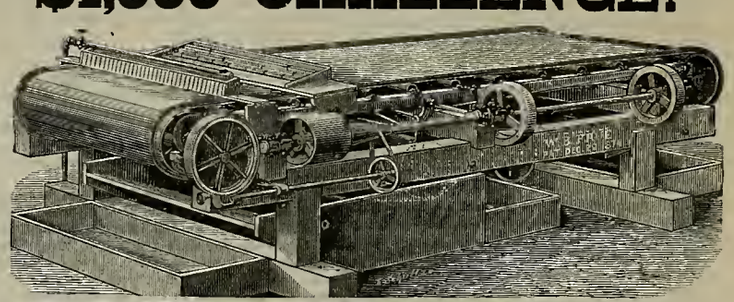

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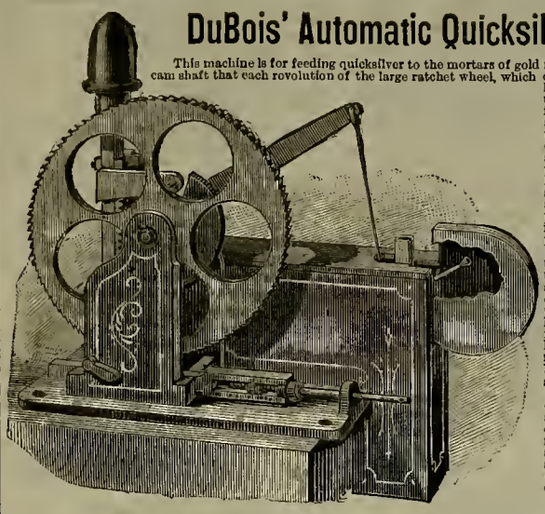
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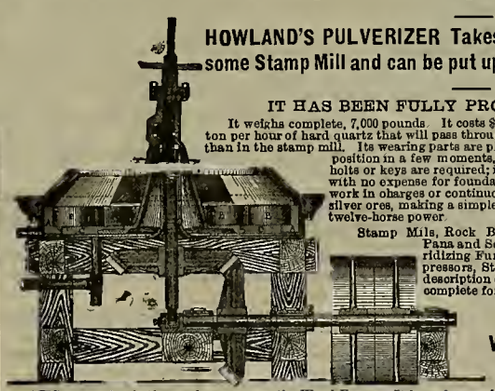
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Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

SIDE SADDLE.—Lewis A. Reister, Chico, Butte Co., Cal. No. 255,334. Dated March 21, 1882. The improvements on this new and improved side-saddle consist in sundry details of construction. It is constructed of leather, with plain or quilted seat. Having no side bars or cantle-board, the saddle fits directly upon the horse's back, and the rider sits low down. The advantage of this is that there is no rock from side to side, and no danger of hurting the horse's back. The rear portion of the saddle or the seat has no frame whatever, and is simply a pad which extends backward from the steel saddle-tree, and lies directly upon the horse's back. It is an objection to the old style side-saddle that it gives its rider an awkward and uncomfortable position, and many have preferred to use an ordinary blanket with stirrup and hand-hold. This new saddle gives to the rider a comfortable and graceful position, embodying all the advantages of the blanket alone, while giving a firmer and more secure seat, because of the steel tree. By having the horn low down, the right knee does not rest too high for ease, nor do the hips cramp, as they are liable to do with a curving tree of the old style.

HOSE COUPLING.—Edward A. Rix, San Francisco. No. 255,335. March 21, 1882. This invention relates to a device for securing the ends of flexible hose to couplings. It consists of a tube fitting within a section of hose, and provided with a flange, against which abuts another flange combined with a ring and clasp, provided at one end with a small screw, and at the other end with a sectional ring having fastening lugs and bolts.

The Microscope in Metallurgy.

At the last meeting of the San Francisco Microscopical Society a paper by Melville Atwood, on the above subject was read by the secretary, as follows:

In a former paper read before this society, the subject being "The Microscope in Geology," I had occasion to remark that the microscope in mining would soon become as important an instrument in guiding the miner in his operations as the compass was to the navigator, as only by the aid of the microscope could he correctly determine what was so necessary for him to know, namely, the true character of the enclosing rocks of the different metalliferous veins he was either prospecting or working, and thereby rendering mining a less hazardous undertaking, and not allowing the art to degenerate into a mere "its porphyry," or "trial-all" system. We are now only beginning to understand and realize the great value of the microscope in metallurgy.

One of its most important uses, however, and to which I particularly wish to call your attention, is in the milling of gold quartz, where it has aided us in distinguishing and proving in the most unmistakable manner the true condition of the gold in iron pyrites, which we now know to exist in a metallic state, being, therefore, only mechanically mixed with the iron pyrites, so that the amalgamation of the gold in the raw ore can be easily effected, and with little loss, if ordinary precautions are taken to have the ore reduced fine enough to liberate the gold inclosed in the finer particles of pyrites. With considerable trouble and expense I have procured samples of pyrites from most of the mining counties of this State and made a careful microscopical examination of them. For convenience and accuracy in their determination, I fastened the crystals and fragments of crystals with marine glue to glass slides. The result of my examination in every respect confirms what was arrived at by Messrs. Daintree and Latta, of Australia, who, in 1874, published the results of their discovery, and, guided by it, up to that date Mr. Latta, at the Port Phillip mines, had treated successfully about 2,400 tons of iron pyrites, which are here called sulphurets. The work has been anything but an easy one for me, but I have done it purely on economical grounds, hoping that the knowledge of the true condition of the gold in iron pyrites might assist and greatly simplify the milling of what has been called "rebellious ores." The specimens I have the pleasure of submitting for your inspection, have been selected as fair samples of what I have examined, and I hope they may prove interesting apart from their utilitarian value. A few weeks ago I addressed a letter, the subject "Milling of Gold Quartz," to the State Mining Bureau (*vide* MINING AND SCIENTIFIC PRESS, December 17, 1881), copies of which can be had by any member of this society who feels interested in the matter. I feel certain that if the suggestions contained therein are fully carried out at the different gold mills, it will add greatly to the gold returns of this State. With regard to the amalgamation of the gold in the raw ore, as far back as 1831, in a communication to the London *Quarterly Review*, on the several modes of amalgamation as practiced in the Hungarian and South American mines, mention is made of a new mill introduced in the Schwartz mines, Tyrol, by Mr. Hocheder, called the "self-acting immediate cold amalgamation mill"—immediate because the stamped ores are given over to it immediately from the stamps. Its action is grinding, washing and precipitating, after which amalgamation takes place. During that process the quicksilver so effectually extracts nearly every particle of gold, or even silver, if not mineralized, that even the most scrupulous assays will scarcely detect any trace of those metals in the residue beyond a trifling quantity in a mineralized state, and this being the same contents as those of the pyrites gained in former washings, proves completely that the present increase of gold, which is obtained from the minutest *laminæ* of gold, which the quicksilver sucks in at the first contact with them, and which are so light that they would be carried away even by the softest current of water on the 'strakes' (blanket tables), as they have no more body than a gold leaf, and very little breadth." In a number of the same *Mining Review*, but published in 1832, on the extraction of the gold by amalgamation of the raw ore, it says: "On the mode of treating auriferous pyrites in Piedmont by M. De Villeneuve, from the *Annales des Mines*. The auriferous pyrites near Venzons are combined with blende and galena, the quality of this mineral varying from eighty-five francs to less than two francs per quintal, or from .000494 to .000010 of fine gold—the number of mills in the valley cannot be less than two hundred." Then follows a long account of the description of the mills, and the account ends by saying that it takes twenty-four hours to complete the amalgamation.

Mr. Atwood's paper was illustrated with several mounted specimens. One slide showed the gold on a crystal of pyrites, which, with the aid of an inch objective, was seen as a beautiful gilding on some of the planes of cleavage. Another slide showed the gold in little drops, also filling some of the small cavities. Still another slide showed the gold in little specks imbedded in the pyrites. Another specimen disclosed the gold in fine specks or scales mixed with the sesquioxide of iron.

Mr. Atwood has found that in the examination of all metals, if possible, good bright daylight should be used. The specimens, as seen by lamplight, did not exhibit the gilding as well as it was seen in Mr. Atwood's office in the daytime. He is to pursue the subject of the use of the microscope in metallurgy at a subsequent meeting.

Lifting Jack for Stamp Mills.

Charles Gracey, of Contention, Cochise county, Arizona, has devised a lifting jack specially adapted for lifting the stamps of ore mills. It consists of a lever fitted through a slotted vertical rack and carrying eccentrically pivoted pawls, which are adapted by the motion of the lever to alternately engage with the rack on each side, and to travel upward, carrying with them said lever. The vertical rack is provided with a peculiar foot, which adapts it to fit the lip of a mortar, in which position the lever extends within the mortar through the screen opening, and may be fitted under the stamp to raise it.

In stamp mills there is frequently a necessity to raise a stamp, and hold it in a raised position. This is accomplished in various ways, but usually by placing blocks under them—a well-known device. This lifting device we are describing is ready of application and serviceable.

A standard is made in two parts, leaving an extended slot between, and upon the sides of the standard are notches having a straight top and inclined faces.

A lever passes through the central slot and has on its sides studs which slide in grooves in the standard. Pawls have their upper ends slotted, to receive the lever. One pawl is pivoted to the lever on each side of the standard, and the pivot points are so placed out of line of the center of gravity that the pawls will always swing toward the standard and engage with the notches or teeth. The ends of the pawls are so made, that in ascending they will slip over the inclined faces of the teeth and engage with their straight tops.

In applying the device, the broad, bifurcated foot rests upon the lip on the inner lower edge of the mortar. The lever, when at the bottom of the standard, projects its short end into the mortar through the screen opening, and, being about on a level with the bottom of the stamp, is fitted under said stamp, its upturned point enabling this to be done without trouble. When the end is under the stamp, the long end of the lever is drawn up and down by the operator. When the lever is pushed up the inner pawl forms a bearing, and the outer pawl is raised to a higher notch, and so on to the top. Each notch forms a new bearing for the elevation of the lever. As the lever rises, its end being under the stamp, the stamp rises also. By extending the leverage, the operation may be very easily performed. The stamp may be thus raised to and sustained in any desired position.

ANOTHER furnace is to be started at the Eureka Con. The Ruby-Dandersberg and Matamoras are likely to start soon. So, all in all, there is no reason why we should not feel more jubilant than at any time since the first discovery of a mine on Ruby hill.

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Yours Truly, J. M. NELSON.

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THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

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Any stock upon which this assessment shall remain unpaid on the second (2d) day of May, 1882, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the twenty-fourth (24th) day of May, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

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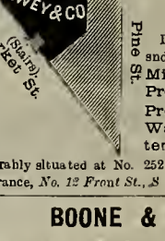

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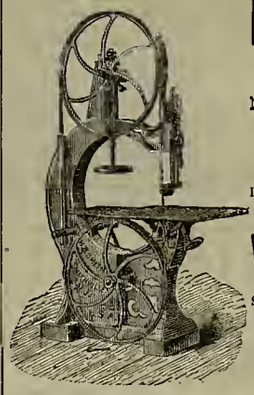

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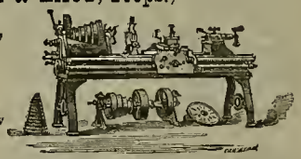

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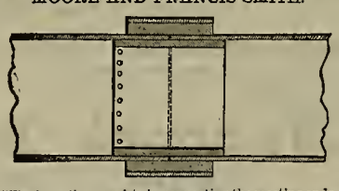

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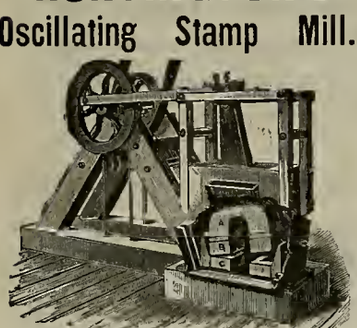

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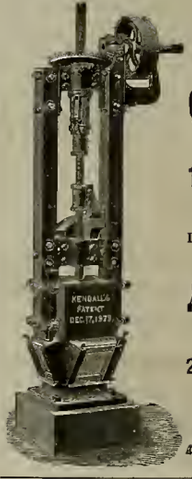

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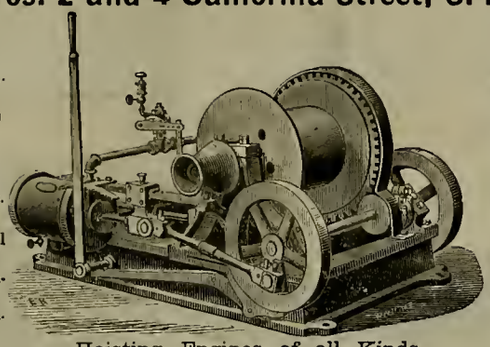

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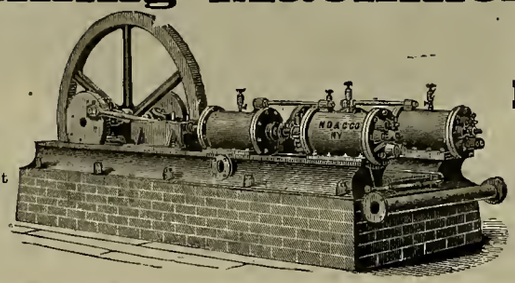

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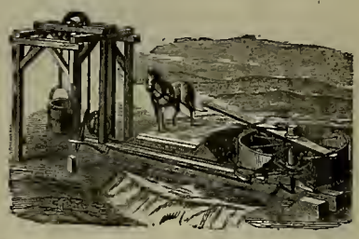

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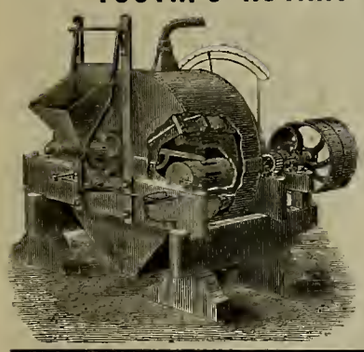

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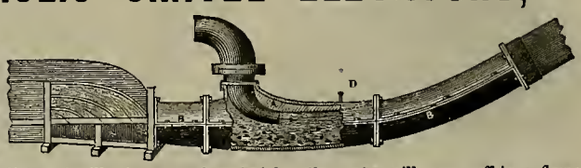

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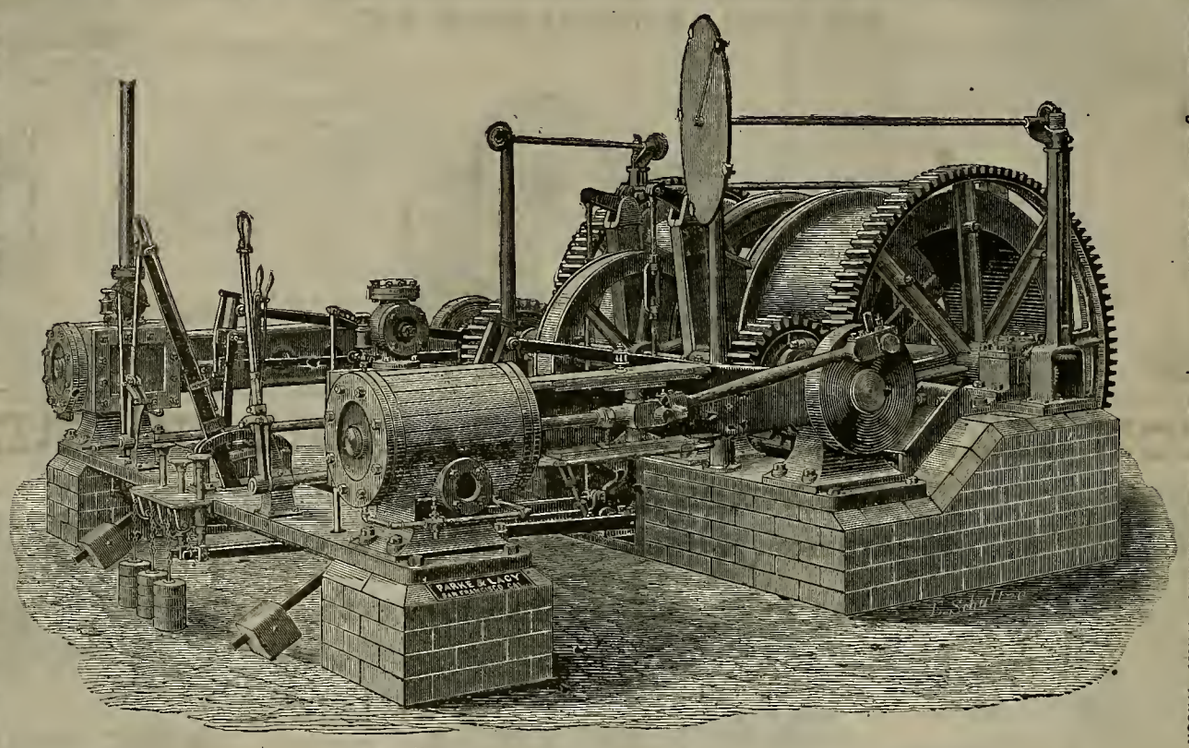

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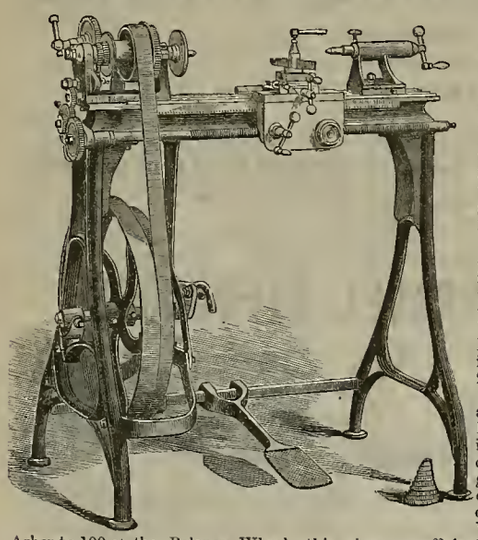

This cut represents a new screw cutting Foot Lathe which was put on the market about two years ago to meet the demand for a first-class tool at a low price, which will do a great variety of work, both in metal and wood, and is the best Lathe made, considering its capacity and price. The cut gives a good idea of its appearance, and below we give dimensions of parts and general description.

Description of Lathe, 4 ft. Bed.

The Lathe occupies a floor space of 28 by 48 inches, the centers being 44 inches high from the floor; the bed is 48 inches long, 6½ inches wide, 5½ inches deep, with double Vs. for Carriage and Tail Stock. It swings 10 inches over bed and 6 inches over carriage, and will turn 26 inches long.

The Head Stock is back geared, and the Cone has three speeds for 1¼ inch belt, the smaller being 3 inches diameter, the larger 6 inches diameter; this, with the back gears gives six different speeds, the fastest giving about 1,000 revolutions of the Arbor to 100 of the Balance Wheel; and the slowest, 75 of the Arbor to 100 of the Balance Wheel; this gives a sufficient range for all kinds of work.

The Arbor in Head Stock has a ⅝ inch hole through it, which is very convenient for turning the ends of long rods, making small screws, studs, &c. The Centres are ½ inch diameter. There is an attachment in Head Stock for reversing the motion of Carriage.

The carriage has a rack and pinion for moving it by hand, and a split nut moved by a cam on the face of Carriage to throw it in gear with screw; the reversing motion is in Head Stock.

The Tool Post has a slot for tools ⅝x1¼ inches; the tool is adjusted by a wedge made on the arc of a circle and fitted to a convex washer. The leading screw runs the whole length of Lathe, and has 10 threads to the inch. A set of gears go with the lathe which will cut all common threads and a great variety of other sizes by compounding them; there is a screw stop on the Carriage for screw cutting, &c.

The Tail Stock can be set over for turning tapers, &c. The spindle of Tail Stock is 1 1-16 inches diameter, and has a motion of 3 inches. The center is fitted to a taper hole, which is the method adopted by all the best makers, and is the same size as the one in Head Stock, so that chucks and other tools fitted to one can be used in the other.

The Foot Motion, we consider the best made, the crank is adjustable and the shaft has swivel bearings; the balance wheel is 22 inches diameter and has 3 speeds to match Cone on Head Stock.

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MINING AND SCIENTIFIC PRESS.

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BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, APRIL 8, 1882.

VOLUME XLIV Number 14.

New Dry Ore Separator.

Wm. O. Bonrne, of New York, bas invented an ore concentrator of that class in which vertical puffs of air through a working perforated plate accomplisb the object. The invention is intended as an improvement on another machine, the main object heing to simplify the oonstrnction hy dispensing with the cranks and their shafts over the belts, and to this end the invention oonsists of a separating chamber and hellows directly connected together hy arms, as sbown in the engraving.

The frame work is represented hy *a*, with its base-rail *b* and top rail, *c*, supporting a top, *d*, which carries the separator case or ohamber A, provided at its lower end with an air-chamher, *e*, resting npon friction-rollers *h h*, secured npon the top plate, *d*, and which hear against supporting-rails, *s*, secured nnder the hottom of the separator case or chamher A, and npon which it is moved to and fro in working the machine. *f'* shows the perforated plate, and *f'' f'''* represent the woven-fahric surface-cushion forming the hottom of the receptacle B, and stitched together, forming a hed for the pulverized ores, which flow automatically from the hopper *l*. *k* is an inclined spont at the opposite end for escape of the waste material. *t* is a curl around the ore-bed. These several parts are readily separated by loosening the hooks *u u*. Below this separator-box, and within the supporting frame-work, a donhle-acting, vertioal hellows, C, having sides *c' c''*, is seoured, the valves of which oscillate upon the hase-rail *b* and have inlet air-valves *m n*, with air-outlets by pipes *o p*, which are connected by flexihle or jointed tuhes *t'* with the lower ends of pipes *v*, attached to the lower face of the separating-chamher, so as to register with the orifices *u* therein, capped by out-let valves *r*. Upon the top edges of the oscillating sides *c' c''* of the hellows C thin plates *g* are secured, which pass into forks in the ends of snspended plates *v v*, fastened on the under side of the frame of the separator-hox.

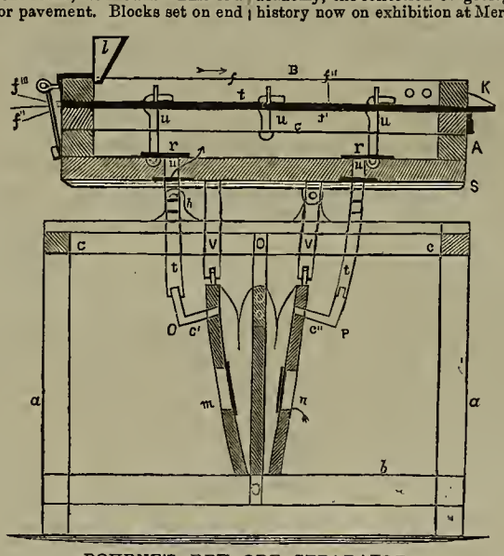
The operation of the apparatns is as follows: The hopper *l* heing charged with the pulverized ore, it will fall upon that end of the separator-bed. The hox is then pushed endwise hy hand or other power, and it will move along the rails hy the carrying-wheels *h*, which motion will cause the mineral to spread on tbe surface of the hed. At the same time the bellows *c'* will collapse, forcing its air, hy the pipe *o* into the air-chest and through the sieve and bed of ore. The motion is then reversed, when *c'* will take air hy the valve *m*, and the hellows *c''* will give ont its air to the chest hy the pipe *p*, which operations are repeated at will. The action of the air will lift and agitate the powdered ores, oausing the heavier or metalliferoue portion to concentrate npon the surface of the hed, and the lighter or waete portion romaining at the top will gradnally work toward and finally flow out hy the epout *k* as "tailings," and when the mineral has collected on the hed in quantity to embarrass working the machine, the material may he collected hy a brusb and shovel for removal.

WHITE AND CHINESE MINERS.—Tbree years ago, eays the Grass Valley *Union*, there were 75 Chinamen and 25 white men employed at the Milton mine, French Corral. Now the entire force consists of white men. A eimilar revolntion has heen hronght about in all the large mining properties on the ridge, through the anti-Chinese agitation, and the exertion of the local Miners' Unions. All the white minere are now memhers of these Unions, as well as all the hossee and foremen. There are some Chinese yet employed in a few mines owned hy white companies, hut it has become so nnpoonlar to employ this labor, that it will not he long before it can he said that there are no Chinese employed hy white men to work in the mines of Nevada connty.

PACHECO tried to pass the hill Saturday donating certain military lands in Inyo Co., Cal., known as Camp Independence, for school pnrpoees, hnt failed. He gave notice, however, that he would try it again next week.

Sluice Pavement.

In answer to the inquiry as to the hest material for paving sluices, where a great deal of material passes over them, we give an engraving showing a rock-paved sluice. The rocks are placed as shown on the hottom of the sluice, with hraces at intervals to keep them firmly in place. A thick streak of plank is placed along the sides above the rocks, as shown. This is a common lining or pavement. Blocks set on end



BOURNE'S DRY ORE SEPARATOR.

are more common. Old railroad iron is also used, as are broken car-wheels; the irregular crevices making good riffles. Almost anything will do that will stand wear and form suitable crevices, but blocks and stones are most common.

A SEVERE MINING ACCIDENT.—Yesterday morning about 6:30 o'clock Philip Dolan met with a sevsre accident and had a very narrow escape from death. The accident occnrred at the joint Ophir and California winze, which was sunk to the 2900 level. It is a two compartment winze, and Dolan stooped down over that compartment in which the cage was np. While in this position he called out to the men below to send up the cage, meaning that of the other compartment, which was down. At this moment the cage that was above came down and struck him on the head, jamming him down to the floor and holding him prisoner hy the head until the cage was rung up. The bridge of his nose was broken and his face and head badly bruised. He was taken to his residence on Summit street, and will come ont all right in due time. But that the cage was a light one, such as is used in winzes, and traveling slowly, Mr. Dolan would undouhtedly have heen decapitated.—*Virginia Enterprise.*

PAVEMENT FOR MINING SLUICES.

COPPER mines are what miners are now striving for. They are preferred to gold or silver properties. New Mexico will produce some splendid minee of this character.

BONANZA CITY, N. M., will, the minere think, grow rapidly during the approaching eummer. It hae waited for its hoom for several years, and it hegine to look as if the time had come.

A Generous Gift to Science.

Tbe following report, read at the last meeting of the California Academy of Sciences, is self-explanatory: On tbe 20th of March, 1882, the joint committee of the trustees of the Academy of Sciences, appointed Geo. Davidson, Justin P. Moore and H. W. Harkness a special committee (with power to add to their number) to obtain subscriptions to purchase, for the academy, the collection of geology and natnral history now on exhibition at Meroantile Library hall. The committee examined tbe report made hy the previous committee appointed hy the council and trustees to devise some systematic plan of action; and after an nnderstanding with Mr. Ward, the committee was in a position to know definitely the lowest price of the collection. This was due to those who were to be solicited to subscribe. The individual memhers of the committee had asked the advice and assistance of one of our life members, and were assured of his hearty co-operation. They also consulted with Charles Crocker, who had already acted so munificently that they expected mainly to profit hy his advice and influence. Upon his invitation the committee met him npon the subject and very soon learned that he had formed a definite project in his own mind to secure for the academy the whole collection as it stands.

Mr. Crocker's project was simple and to the point; he proposed that he and Gov. Stanford should purohase the entire collection and present it to this Academy. When Gov. Stanford came in Mr. Crocker named the proposition to him, and after a short interchange of views as to the merits and wante of other institutions, Gov. Stanford promptly and cheerfnlly acceded to the project. Each of them drew his check for the sum of $8,000; and thus, through the broad spirit and generosity of these two gentlemen, the California Academy of Sciencee becomes the possessor of this magnificent collection, which mnst necessarily grow hy additions, and thus become the largest museum of geology, mineralogy and natnral history on the Pacific coast. The committee then proposed to the donors that the collection should hear their names, and after overcoming objectione on their part, we are permitted to use our judgment in this matter. This committee therefore proposes that this collection shall he known as the "Crocker-Stanford Collection of Geology, Mineralogy and Natnral History." As the subject-matter of education was freely discnssed at this interview, the committee feel they may he justified in availing themselves of the opportunity to place npon record their high appreciation of the liberal and advanced sentiments which these gentlemen expressed upon the snbject of such collections, as great factors in the practical education of our youth, of their deep interest in technical edncation generally, and especially of their conviotious that the University of California wonld attain the highest possihle position as the culminating point of the educational system of this State and coast.

The committee also heg to report that Messrs. Crocker and Stanford were assured this collection would he continned on exhibition nnder certain conditions. In view of this fact, your committee have to-day taken steps to secure snbscriptions to pay the rent and cost of exhibition, insurance, etc., for the next year, in some snitable hall. Thus far we have met with favorable success, and feel that we may say that, with little difficulty, the reqnisite amonnt will he secured.

(Signed) GEORGE DAVIDSON,
JUSTIN P. MOORE,
H. W. HARKNESS,
GEORGE E. GRAY,
JOHN F. BOYD.

The committee were instructed by the Academy to solicit subscriptions to an amount sufficient to defray the expenses of keeping it open for at least a year, or until the Academy may he able to have a building of its own built, suitable as its repository.

Mr. Curry moved that suitable thanks be conveyed by the Academy to Messrs. Crocker and Stanford for their most generous donation, likely to prove so nseful to the Academy and to all students of natural science on this coast, and that the same, when prepared, he spread npon the minutes.

Mr. Moore thought the acqnisition of this collection wonld give the Academy an impulse which would eventually result in their getting a new building of their own.

Professor E. T. Cox said the fact of this donation would he an encouragement for the American Association for the Advancement of Science to accept an invitation extended them to meet here in 1883, when the presence here of its 400 memhers, all learned and celebrated scientists from all parts of America, wonld result in great good to our State, and could not fail to awaken increased interest in scientific pursuits. It would speed that momentnm which the Academy had already received through the munificent gifts of Messrs. Crocker and Standford.

NEW MONTANA MINES.—A dispatch from Chicago says: Two very promising gold and silver mines have heen discovered on the line of the Northern Pacific railroad in Montana, and rapid stridee are now heing made toward their development. One is called the Maginnis mine, and is located 60 miles south of the Missouri river, 140 miles north of the Yellowstone, 20 miles west of the Mnssel Shell, and on the eastern hase of the Big Snowy mountain. The other mine, called the Clark's Fork, is located farther to the eouth. It is just west of the Clark's Fork river, south of the Yellowstone river, and very nearly touches the northern houndary of the National Park. It ie abont 60 miles southwest of Coulsen.

FREE PUBLIC LIBRARY.—The regular monthly meeting of the Trustees of the Public Library was held thie week. Secretary Moulder reported expensee for March aggregating $2,585 98. For hooke the sum of $983.02 was expended; for salaries, $944.75. The halance to the credit of the fund is $16,765.87. Accrued and estimated liabilitiee reach $9,977.31. Mr. Perkins, librarian, reported 37,903 visitore for March. During the month 18,723 hooke were taken from the library, and 12,110 used in the rooms. The Tustees authorized the purchase, at a cost of $580, of a series of photographe from the collections of the British Mnseum. George H. Rodgers was elected President of the Board of Trustees for the eneuing year.

CORRESPONDENCE.

e admit, unendorsed, opinions of correspondents.—Eds.

Snow Perils of the Upper Sierras.

A Week of Suspense in the Snow-Blocked Mining Town of Lundy.

Editors Press:—The village is situated in Mill Creek canyon, surrounded on all sides, except the east and a emall opening to the west, by precipitons mountaine of granite, rising at an angle of 50° to 70° to the hight of 2,000 to 3,000 ft. The site of the town is a gentle declivity towards the south, covering about 250 acres. On the north the mountains are fully 2,000 ft. high, and at a distance of 200 or 300 ft. from Main street they rise at an angle of 50°. On the south side Mt. Gilcrest towers to the hight of 3,100 ft. above the town, at an angle of 50°, the base terminating at Mill creek in the south margin of the town, about one-fourth mile from Main etreet, with only a few bnildings along its base. On the southwest side frowns Mt. Scowden from a hight of 2,300 ft., its upper half nearly perpendicular and its lower half at an angle of 60°. The storm began on Thnrsday night, 9th of March; on that night and the following Friday snow fell to the depth of 15 inches. Saturday was clear, but on Sunday the snow fell lightly all day, and on that night the terrible storm began in earnest and raged almost continuously until Friday, the 17th, on which day the sun rose clear and bright, and the etorm was again renewed on Saturday and Sunday, accompanied by a terrific gale, probably bringing the greater part of the snow that lodged in the canyon from the high peaks in the vicinity. By Wednesday evening (the 15th) the village was snow-blocked and all commnnication with the outside cut off. The Sierra telegraph line kept up till about 5 P. M. At that hour came the

First Alarm from an Avalauche.

Starting near the summit of Mt. Scowden, ite velocity was something fearfnl and indescribable. Dropping from tbe almost perpendicular face of the mountain, at a hight of 2,000 ft. above the town, it came with such tremendous force, causing it to leave the ground long before reaching the hase, shooting with lightning speed as far east as Chicago avenue, 1,500 ft. from the base of the mountain. The first nnfortunate people residing in its track were the family of Mr. Mayes, consisting of himself, wife and three children. The house (a frail one) was swept away, and the entire family covered four ft. deep. It next strnck the large canvas house on the north side of Chicago avenue, occnpied by Mr. Winter and wife. Tbis was completely demolished, and both occupante buried to tbe depth of eix ft. Fortnnately none of the seven persons in these buildings were seriously injnred, as they were quickly uncovered hy a number of citizens going to tbeir assistance. Before striking these houses the avalanche shot entirely over a cabin occupied at the time by Jos. Carron, Gns Duval, George Cbagnon and one other man. It was buried by snow falling on it, but none of the men were harmed. The track of thie avalanche was a little east of the May Lundy mill, harely missing it, if, indeed, ite force was not high enongh in the air to have cleared the roof of the mill altogether. An hour later the next

Avalanche Came from the North Side,

Directly back of the most densely built portion of Main street. Its force was broken by striking on a level hench or bluff 200 feet back from Main street, almost overhanging the May Lundy botel. The whole mass of the slide seemed to be instantly dashed into spray, and dispersed in every direction, doing no damage beyond filling the center of town with flying snow, and blinding for the time those in the streets, and plastering the house-fronts on the opposite side with the hardened snow. Although there had been no damage from this, it was terrifying enough to thoronghly alarm every person in the town. It bad become quite dark by that time, and the storm was raging with a fury to appal the bravest. No one knew where to look for safety. It soon became evident that this part of the town was comparatively safe, and many women and children in exposed locations collected there, and the citizens who had no familiee to protect, collected at several points of rendezvous, prenared with shovele to go at tbe first call of alarm, and it is fortunate that they did so. Avalanches were now coming from all sides. Every few moments through the blinding storm came the roar of the rocket slide, followed by a rush of wind and flying spray, and occasionally the crashing and thundering of the heavier avalanche, that kept closer to the ground, striking terror to the stoutest hearts, though they may have felt safe themselves. This Wednesday night was one that will never be forgotten by the inhabitants of Lundy, and the poor fellows on tbe outside in isolated buildings, far

Beyond Help from the Town

At 11:30 came faint cries for help through the roaring of the storm; they seemed to come from the base of Mt. Gilcrest, neerly one quarter of a mile south of Main St. It was aoon found by a large party of rescuers that an avalanche had swept down from that monntain, crossed Mill oreek, and carried away the log cabin occupied that night by Abner and J. A. Bagby, and Fulton Ishell, and buried all of them deeply. By good fortnne, one of the brothere could work a little, and by great effort managed to dig near enongh to the surface to meke himself heard. Tbe two Bagby brothers were soon releesed, but it was an hour before Isbell was rescued. He was held down firmly by the logs of the building, and could not have survived much longer. Their escape was almoet miraculons, as the honse (a very etrong one) was entirely demolished, with everything in it. Another terrific avalanche came just as the rescners approached the Bagby house. The spray from it blinded and etaggered the party, thongh it came nearly a half mile west of them.

It Shot Down from Mount Scowden,

Taking in its course the May Lundy mill, at the west end of Cbicago avenue. It seemed to have shot entirely over the mill, only crushing in the back wall of the blanket and pan rooms, and carrying away the emokestack, jumping the mill and landing tons of snow in the dump yard beyond, end rushing as far as the store, 200 feet further east. On the eonth side of Mill creek, in the rear of the mill, this avalanche swept away a small house, occupied up to that evening by two men, who just escaped in time. All through the night came the rush of the slides and the roar of the heavy avalanches, which conld not be located by the watchers. No further destruction occurred within tbe town limits, and the light of morning was welcomed by many anxious watchers, while on the outside it was far more disastrous. At 11 o'clock,

The Most Terrible of All the Avalanchee

Descended into Lake canyon, two and a half miles south of town. It started near the summit of Mount Discovery, over the north end of the Jackson mine and sonth end of the May Lundy mine, breaking along the face of tbe mountain for several hundred feet in width, narrowing again as it descended, gaining force end velocity, and running one and a half milee before stopping. Situated in the center of Lake canyon, on a considerable knoll, was the two-story frame bnilding owned and occupied by Trumble & Monroe, and occupied on that fatal night hy Stephen and Robert L. Trumble, Henry Sboemaker, Alex. McKean, Conrad Hoblitzel and D. B. Grant. The house was etruck and crushed into fragments, and carried 100 feet on to higher ground. All of tbe sleeping occupants were buried deeply. Stephen Trumble, however, dng his way out, and reached tbe cabin of Patrick Ragan, barefooted and nearly naked, through the terrible etorm. He was only enahled to do this by fortunately getting hold of two blankets that were cast near him in the wreck. These he threw out before him, and crawled to the vicinity of the cabin, as near as he could guess at it in the storm. He was pretty hadly hurt, and also frozen, but at present is able to be ahout. Mr. Ragan, the only person in the vicinity, went to the wreck and searcbed till daylight; tben, feeling snre that there could be no chance for any of the others to he still living, he came to town for assistance. He arrived at noon, and ten men

Volunteered to Go Up,

Hoping to find some of them living; tbe constantly threatening avalanches from the nearly perpendicular walle of Lake canyon, rendered their efforts almost hopeless; they, however, reached the scene of the disaster on snow-shoes by 5 o'clock, and eoon released Hoblitzell alive; he had just recovered consciousness and made himself heard. He had been buried for 19 hours, six feet deep under the snow, and his snfferings were horrible; by six P. M. they had recovered the deed bodies of Roht. Trumble, Shoemaker, and McKean, bnried abont eight feet deep and apparently killed or smothered at the first. Darkness closed in and prevented further search for Grant, and fortnnately so, for a second avalanche came shortly after, larger than the one of the previous night, burying tbe recovered bodies 16 feet deep, and fnrther work had to he euspended until the following Monday, the 20th, when 22 men went up and excavated the three bodies a second time, and fonnd that of Grant, who had been killed outright in the first avalanche and carried 100 feet to near the place where S. E. Trumble had extricated himself. Other slides occurred in Lake canyon, one sweeping away the stahle at the toll-house. Friday morning wae cleer and bright, and hy 4 P. M., H. P. Medlecott, Joe. Plant, Jas. McCollum, and William Miller came into town from the Gorrilla mine, one mile up Mill creek; their escape from death was almost a miracle. The house was situated under a perpendicular bluff 200 feet high. On either side of the bluff was a eharp canyon reaching to the snmmit, down which thundered avalanches at short intervals all through the early part of Wednesday night, nntil the canyons on either side were piled with snow to a great depth. At abont midnight a slide broke off laterally from the west canyon and crushed the house, burying them all 10 feet deep. Fortnnately one of them was in a position to work a little and

By Great Labor Dug to the Surface,

And after houre of labor released another. Judge Medlecott and Plant were in the wreck four hours; the former nnder the weight of 10 ft. of enow, with the hsavy hoards of a sleeping hnnk pressing so heavily on him that he could not move a limh. His sufferings were fearful, and he could not have lived much longer. Their severest trials were to come yet. All in bare feet and only their underclothing, they nearly perished before all were dug out. The storm was raging fnriously, and nothing to ehelter them. Added to this, slides were thundering past end over them; and their only chance to live now was to drift through the snow a long distance to the mouth of the tunnel, at which the blacksmith shop was situated, and both were hnried deeply out of eight, and their locality guesswork. This they

Succeeded in Reaching by Daylight,

And were obliged to remain all of Thureday and Thnrsday night without either fire or dry clothing. On Friday they started down to the town, Medlecott harely able to drag along with the assistance of the others. An hour later newe came of the destrnction of the bnildings at the Great Sierra tunnel, Tioga district, eight milee sonth of Lundy. Twenty-two men were buried in the wreck, but all were dug out with no serious injury to any. The immense avalanche that swept over these buildings came about 11 o'clock on Wednesday night, at almost the same hour as the other disasters. It was vaster in volume than any of the others, and coursed for fully two miles. The house was very strongly conetructed of logs and benked up high with enow, and the avalanche only carried away the top logs and roof, to which circumstance, many, if not all of the occupants owe their lives. By this time, all on the outside in exposed localities had been heard from except a party of four, who were living near the

Head of Mill Creek Canyon,

Three miles west of Lundy. A party etarted to their rescue on Saturday, and met two of them just ahove Wasson, on their way down. It eeeme that these men had been in a secure place, as the avalanchee that swept past and over them were spent and turned aside by a projecting cliff of rocks above the house. They report the situation in Upper Mill Creek canyon as one of almost uninterrupted avalanches from both sides. The town site of Wasson is, for the greater part, deeply buried by elides coming from both sides, the avalanches in some instances meeting midway of the canyon. Some of the buildings were destroyed, but very fortunately none of them were occupied thie winter. During these

Daye of Anxiety,

Tbe inhabitants of Lundy witnessed some sights of awful grandenr from the town. Friday morning hroke bright and oold, and there wes joy in every household. Mount Gilcrest rises abruptly from the south shore of Lake Lundy, and the town ie at the west end. On that morning a euccession of tremendous avalanches shot out from its very summit, 3,000 feet above the lake, keeping close to the mountain for several hundred feet, bnt long before reaching the base it left the ground, shooting with lightning velocity far out over the ice, and gliding across to the north shore. The writer witnessed some of the grandest of these from the very moment of starting. From the highest peak on the north face of Mount Gilcrest they shot down with tremendons velocity for a second or two. Then, as they receded from the peak sending up vast clonds of flying snow spray, white and flame-lit in the morning sun, leaping, curling, rolling higher and higher as they neared the bottom, until midway over the lake they eeemed 500 ft. high, and continued to roll far up the mountain on the opposite sbore, two miles from the starting-point. All thoughts of the danger of the pest 48 hours vanished in the awful sublimity of these scenes, witnessed as they were from a point of safety, with the glad sunlight flooding the tips of the mountaine once more.

The lesson from the

Experience of thie Unprecedented Storm

Will he of great good to the residents and mine ownere of Homer district. All places of danger are mapped ont in the memory of many who were here to see it. The impression may go ahroad, from some accounts of it, that there is no safety here; hnt snch is not the case. There is ample room in closc proximity to the minee where it is absolutely safe to build, and at every mine safe localities can he selected for their works; and with proper precantion in building in the fnture, a re-occurrence of these diaastere will never be known to Homer district again. H.

Alpine County Mines.

Editors Press:—It has been storming here the past few days and enow ie now four feet deep on a level. Of conrse all ontside work is suspended. The Alpine Hydraulic Mining Co., in which I am interested, is now running a ditch to their gronnd. It will be three miles in length and capable of carrying 400 miners' inches of water. We expect to complete it by the 1st of June and he ready for work with the hydraulic. Tbe company has 160 acres of ground; it ie prospected by three shafts and one tnnnel, and all the gronnd exposed by the same will average $1 to the square yard. We expect the first month's rnn will reimbnrse ns for the ontlay. Abont the only other mining going on at present in this district is at Monitor, where the Stella mine employs a few men and is taking ont about three tons of ore daily from the npper levels. This mine would probably, if sinking were commenced, develop some good milling ore, that would pay expenses of extracting and perhaps a snrplus for the stockholders. Jas. Curtain.
Markleville, Alpine Co., Cal.

Antimony Mine.

Editors Press:—We wish to call attention to what we consider a valnable antimony mine, located in Relief district, Humboldt county, Nevada. Thie mine is east from Lovelock, on the C. P. R. R., 18 miles, a good natural road leading to the same. The mine has been prospected a distance of 300 ft., opened in half a dozen places and a shaft sunk on one side of same 25 ft. The ledge proper is from 25 ft. to 30 ft. wide and assays from 20% to 70%. Prof. Blake visited the same and pronounced it the largest ledge of the kind on the coast. Water on the ground and thousands of cords of wood from 12 to 15 miles distant. One carload was recently shipped from same, hut the owners not being mining men or troubled witb much money, would prefer to have some one purchase and work the same successfully, as we feel confident can be done. We will take any one to tbe mine free of expense from the railroad and back, and guarantee the ledge to be as wide as stated. Emmons Young.
Lovelock, Humboldt Co., Nev.

A Blind Miner's Belief.

H. Clendenniug, tbe blind miner of Randolph Flet, this county, is a character out of the ordinary run of mankind. He is far advanced in age, and lives with his wife and 20-year-old son on a little ranch. They have some chickens and a few head of live etock, and these, together with the earnings of the hoy, who at times works for companies in the vicinity, enables them to subsist comfortably. Clendenning lost his eyesight 25 years ago hy a premature hlast when he was working at Iowa hill, Placer county. He is a man of marked intelligence and is well posted on current events here and elsewhere. His distinctive characteristic is that he believes be can locate and measure subterranean gold-bearing gravel deposits hy eurface indications. Tbe old man has a claim at Alta hill that he has worked on for 10 years, running from 4,000 to 5,000 ft. of tunnels and drifts and not as yet discovering a solitary speck of gold as hig as a pin-head. He claims, however, that tbe signs tell him in unmistakable language, that there are gold deposits in his ground, one of $500,000, another of $300,000, and a third of $200,000. The faith that ie in him growe stronger and stronger ae age creepe upon him, and the fact tbat he has fooled away 10 yeare and not realized bis dream, has no effect in convincing him that his tbeories are not founded on a practical basis.—*Nevada Transcript.*

Arizona Hydraulic.—A clean-up at the Excelsior Hydraulic digging on lower Lynx creek, eight miles east of Prescott, on Monday, (the first made this season), yielded 70 odd ounces of gold, worth $18 per ounce, paying $10 per day to the man for the work expended on tbe claim after the water came. B. C. Smith, the superintendent, says there is no end of the same kind of ground to wash, and every prospect of a long and prosperous season. H. A. Bigelow and others took out the water on the ground in question in the spring of 1806, at a cost of $4,400 gold coin, and the property has changed hands severel times since, the ditch bas been enlarged, reservoir constructed, and other improvemente made, and now, after having been worked more or less, according to tbe run of water in the spring, for 16 years, the valne of the claims is just beginning to he appreciated.—*Arizona Democrat.*

Blast Furnaces.—There were 25 blast furnaces built in the United States in 1881, and 23 were in process of erection, while 12 were abandoned. Tbe total number of furnaces existing at the close of 1881 was 716, compared with 701 at the close of 1880. At the first-named period 457 were in blast and 259 ont; at the last-named period 446 were in blast and 255 out. The total production of pig-iron in 1881 wae 4,641,564 net tons, against 4,259,414 tone in 1880, and 3,070,875 in 1879. The stocke of pig-iron unsold in the hands of makers or their agente at the close of the last three years were as follows: 1881, 210,896 net tons; 1880, 456,658 tons; 1879, 141,674.

On the Action of Salt Upon Copper.—Writing to the *Chemical News*, Mr. R. Monger, of the Middle Bank Copper works, Eogland, states that he noticed in the course of some laboratory experiments that, when melting copper and salt together, the metal became tougher. He concluded that the salt might possibly dissolve the cnprous oxide out of the copper, and proved by trial that salt has the eame effect as poling. He believes that the determination of the loss after the treatment with salt is an easy and rapid method for the estimation of cnprous oxide in copper.

It is believed in Germany that emigration to America this year will be far greater than it was in 1881. Perhaps the German government may seek to prevent such increase. It ie a matter of moment to that government that it should every year lose so many of the best and bravest of its subjects. Just now such men are much needed, as it is threatened with a Russian war. Russians do not emigrate.

Mechanical Progress.

Lubrication.

[Abstract of a note on "Lubrication," by Thomas Farmer, F. C. S., read before the Liverpool Association of Science and Arts.]

In a steam engine, where many parts are moving, a large amount of friction is produced, which tends to stop those parts, and it would ultimately do it, were they not continually re-supplied with fresh motion obtained by the burning of fuel. Hence it is apparent to everyone, that the engine has not only to overcome the resistance of the work to be done, but also the resistance offered by its own parts. In other words, the amount of heat manifested in friction is the amount of extra heat that will have to be generated under the boiler, and the extra cost of working will be the cost of the fuel necessary to produce the heat.

Importance of a Good Lubricant.

From the experiments of Morin, we find that the friction of a cast-iron shaft upon a dry bell-metal bearing amounts to 0.2 of the transmitted power, while with a wrought-iron shaft the friction is more than 0.25; therefore, if such shafts were dry and unlubricated, one-fifth and one-fourth respectively of the total fuel cost would be wasted in overcoming friction. By careful lubrication of the same shafts, the loss may be reduced to 0.065 in the one case, and 0.089 in the other. Hence the importance of a good lubricant. One of the next essential points is that it shall be properly distributed over the surface on which it is required—that just sufficient shall be used and all waste avoided; otherwise, what would have to be spent in overcoming friction will have to be spent in buying oil. Putting aside the commoner characteristics of a good oil, such as the absence of acidity, either natural or artificial, and the absence of gumminess, one of the most commonly believed ideas is, that an oil of high specific gravity is the best for lubricating purposes. Although this may be true in certain cases, yet from observations and experiments made over a long period, I have found that they are not always the best, and that the point upon which we must rely is the *viscosity*.

How to Test the Viscosity of Oil.

To test this I have found a French pourette graduated into 100 c.c. to be most useful. The pourette is fitted on a stand and filled with the oil to be tested; after allowing all bubbles of the air to separate, it is permitted to run through, and the time it takes to do so is carefully noted. At the close of the experiments it will be found that the viscosities are directly proportional to the time taken: thus if a mineral oil takes 15 seconds and rapeseed oil 45 seconds, the viscosity of rapeseed oil is three times that of the mineral. The temperature may be either 60° or 90° Fahr, but the latter is preferable, as the oil may be subjected to that temperature when in use. The question next arises, how is this viscosity basis to be applied? If an oil of very high viscosity, such as castor or rapeseed, were used to lubricate an engine of low horse-power, we should in all probability find that, instead of reducing the friction to a minimum, it would itself become a source of resistance and increase the evil. And conversely, if an oil of very low viscosity were, used to lubricate an engine of high horse-power, we shall find that the friction would be but slightly, if at all, reduced. Hence, when we come to look at extreme cases, we see that there exists a very marked connection between viscosity and horse-power. A high viscosity is not suitable for a low horse-power, and conversely, a low viscosity is not suitable for a high horse-power. And just as the case holds for these extremes, so does it hold for every point between them; the viscosity must always keep parallel to the horse-power.

How to Render Oils more Viscous.

The same rule holds with respect to machinery, and to insure perfect lubrication the viscosity must gradually increase with the ponderousness. From this it is clear that economical lubrication does not consist in procuring and using the thickest oil possible, but the oil that is best adapted to the nature of the machinery, and scientific mixing likewise consists in compounding oils most clearly adapted to the purpose for which they are to be used. It is rather difficult to say what oils are most suitable for mixing purposes, but it may be stated with a tolerable degree of accuracy, that the best method is to take a basis of American or Scotch mineral oil, 885° to 903° sp. gr., and add either olive, lard, rapeseed, or castor, to "work up" the viscosity. Olive and lard, when mixed with mineral in proportions 10, 20, 25, and so on up to 75 per cent., are about equal in value as lubricants of the lighter class of machinery. Rapeseed oil in like proportions is valuable where the machinery is of a heavier kind, or where the lubricant has to be used throughout a works in which the machines vary much; but in such a case it will be better to divide them into classes and use a special oil for each class. Castor-oil mixed with mineral in varying proportions may be used in the case of the most ponderous machinery.

An Interesting Phenomenon.

In mixing castor I noticed a remarkable and interesting phenomenon. On adding about 25% to an American neutral oil of a reddish color, I was surprised to find, after the lapse of a few hours, that the oils had separated, and that the castor, originally quite clear, had taken down with it nearly the whole of the coloring matter, leaving the mineral oil a beautiful pale, straw-colored liquid. I further found that the successive additions of fresh castor still further removed the coloring matter, until both castor and mineral were of the same tint. Continued experiments showed that if the castor were first mixed with an equal bulk of olive or rapeseed oil, and then added to the mineral, the mixture was of a permanent character.

In conclusion, I have found that a properly-mixed oil is in every case far preferable for general use, to either mineral, olive, lard, castor or other oil used singly; and it may be added that no oil is more suitable as a basis for mixing than mineral, and that cold-mixed oils are better than those mixed at a temperature over 100°.

Progress in Machine Construction.

The recent stimulus of abundant orders for all kinds of shop tools, engines, boilers and railroad equipments has greatly encouraged improvements in machinery. A prolonged feverish demand for shop tools and motors for manufacturing establishments might have been expected to repress almost any tendency to innovation of design while such a state of trade should continue, but the result has been to check little more than those questionable changes, such as seem to conflict with generally-received principles of correct mechanical practice. With a steady and profitable demand for the output of shop, mill or factory, proprietors are naturally averse to trying any doubtful experiments with machinery or fixtures. To this fact, in a great measure, is due the reliable and permanent character of most mechanical devices introduced and applied by established concerns within the last 12 months. Our columns have from week to week borne numerous evidences of progress in designing and building lathes, upright drills, planers and shapers, milling machines, gear cutters, stationary steam engines, steam pumps, locomotives, steam generators, and special machines for a wide variety of purposes.

An accelerated demand for these productions, of the exact styles now turned out, does not seem to have prevented reasonable and desirable changes, nor is it probable that it will do so in the early future. Reward or condemnation, in these busy times, is almost sure to follow swiftly the introduction of mechanical innovations.

Thus far there has been very little danger of an over-production in any class of shop equipments. The real trouble has been, and still is, to obtain within any reasonable time the tools and supplies needed in machine shop work. Electric lighting is very much retarded by the unavoidable delay in securing engines and dynamo machines, to put new plants into operation, and railroad and locomotive shops are seriously inconvenienced by waiting so many months for heavy tools and equipments, there being but few establishments in this country making a business of building such tools.

With a hundred thousand miles of railroad in the United States, and with extensions going forward at a rate never before known, the need of special heavy tools for railroad shops is likely to increase faster than the facilities for supplying that need, especially as it would require months, if not years, to fit out a new shop and make ready to turn out machinery of this class. —*American Machinist.*

The Pro and Con of Brakes.—Some portions of a well-considered and carefully-written article on "Brakes," which has recently appeared in one of our English exchanges, may be of interest to our readers. After describing the leading styles of brakes to be seen upon both English, German and French vehicles, the writer says: Brakes, though possessing many advantages over the old "dragshoe and chain," are open to many grave objections. They often lengthen the carriage and increase the draught, by causing the hind wheels to be placed further back than they otherwise would be, in order that the doors may clear the brake-blocks. In certain carriages this objection is avoided by hinging the doors to open in the opposite direction, thereby exposing ladies' dresses to the mud that collects on the tires and brake-blocks. In all carriages the hind springs are, during the application of the brake, temporarily useless. The pressure necessary to generate sufficient friction for the brake-block to "hold" the wheel doubles the strain on the hind carriage, caused by the wheels sliding instead of rolling. When, as frequently happens, a brake has to be fitted after a carriage is finished, new, longer, and stronger pump-handles have to be made, involving expense and delay. A want of modern carriage building is a brake that shall be equally as easy and convenient to use as the present brake, that shall *not* increase the draught of a carriage, that shall *not* disable the hind springs during its application, that shall *not* involve expensive alterations to finished carriages; in short, a brake possessing all the advantages of the present brake, with none of the drawbacks cited above.—*Blacksmith and Wheelwright.*

Scientific Progress.

Respiration in the Mammalia.

The rapidity of the respiratory movements in man is about one inspiration to four heart-beats, or fifteen to twenty-five per minute; greatly varying, however, according to age, sex, and circumstances. In animals with high temperature, breathing is much faster, becoming almost a tremor in birds. In the whale, on the contrary, breathing is suspended while the animal is under water; it being provided with reservoirs of pure blood. When the latter is exhausted, the creature comes to the surface and puffs and "blows" to obtain air and refill the reservoirs.

The difference in color of the blood of vertebrates is chiefly due to the varying amount of oxygen in chemical combination with the hæmoglobin of the red corpuscles—the brightness of color being proportionate to the oxygen. An essential part of the hæmoglobin is iron; and it has been supposed that the change in color is due to a chemical change from a ferrous to a ferric salt. But this simple and plausible explanation is now denied by eminent physiologists, who, however, admit that the iron has some essential but unknown influence. A minor cause of the darker color of the blood is the swelling of the corpuscles by absorption of carbonic acid.

The corpuscles are the oxygen-carriers, seizing the oxygen in the lungs and conveying it to the tissues, where it unites with the carbon and hydrogen. The corpuscles also convey carbonic acid to the lungs, but they divide this labor with the serum.

In large quantity, carbonic acid acts as a narcotic poison; for, on account of its superior attraction for the hæmoglobin, it replaces and excludes the oxygen. Other gases, as nitric oxide, have the same effect. Nitrogen, on the other hand, is entirely negative in its effect on the blood, and consequently serves to dilute the oxygen of the atmosphere, without injury to animal life.

More oxygen is inhaled than is exhaled as a component of carbonic acid. The extra amount doubtless unites with hydrogen to form a portion of the exhaled water, and to produce sulphuric and phosphoric acids.

The human lungs exhale, in 24 hours, about two pounds of carbonic acid. This is the product of the burning of nine ounces of carbon. As giving some idea of the forces within the body, it is interesting to know that the combustion of nine ounces of carbon liberates over 6,000,000 foot-pounds of energy. This is equivalent to more than one-eighth of a horse-power acting continuously for the 24 hours; or it equals 182 horse-powers working for one minute.

Relation of Atmospheric Resistance to Temperature.

Hirn has presented a memoir to the Belgian Academy in which he gives the results of numerous experimental researches upon the relation which exists between the resistance of the air and its temperature. The hypothesis of Clausius, upon the constitution of gases, was supposed to furnish the means of calculating their resistance *a priori*, but upon attempting to establish the formula experimentally Hirn was unable to obtain the results which he anticipated. The memoir was submitted to the examination of Messrs. Folie, Van der Mensbrugghe and Melsens. The committee were unanimous in recommending its publication and in expressing the belief that its startling conclusions would be likely to awaken much profitable criticism and discussion, but Melsens was the only one who was prepared to adopt Hirn's conclusions and to admit that they would be likely to require a re-examination of some of the most important conclusions of thermodynamics. Hirn thinks that he has demonstrated that temperature has no influence upon the resistance of gases, that gaseous temperature and pressure cannot be explained by the movements of material atoms, and that it is impossible to give any satisfactory explanation of molecular phenomena without assuming an immediate dependence upon spiritual influence.—*Bull. de l'Acad. de Belge.*

Effects of High Barometric Pressure.—Careful simultaneous observations at different points appear to indicate that barometric pressure may sometimes affect the ocean level. Some noteworthy phenomena occurred during a recent season of high barometric pressure over southern Europe, which have been alluded to as follows: At Antibes (a seaport in the south-east of France) the sea level was depressed about a foot, laying bare portions of shore over which boats can usually sail, and exposing surprised sea slugs and other marine animals to the direct rays of the sun. This continued about a fortnight, and is attributed by M. Faye to the high air pressure. Again, Gen. de Nonsouty reports from the observatory at the top of Pic du Midi that the lowest temperature there this winter has been only 5° C., and during the recent high pressure, from January 8th to 20th, the air being in a state of exceptional purity, temperatures as high as 26° C. were registered. The highest at Bagueres-de-Bigorre is considerably short of this, so that we have here an inversion of temperature with altitude. The General states further, that from the 1st of January the zodiacal light was distinctly made out; probably this has never happened before in our climates, so near the winter solstice. Once more, the General and his assistants, on January 20th, at 6:30 P. M., saw distinctly the earthshine on the moon and the thin crescent, though only 25 hours 46 minutes old.

The Expanding Power of Ice.

In a recent number of *Nature*, Mr. Bergh has drawn attention to the powerful agency exerted by ice in severing rocks, of which he gives a striking instance occurring on the Aalesund, in West Norway, where a low ledge rising out of the fjord is all that remains of a once extensive fjæld promontory, which, in the year 1717, was suddenly blown up and precipitated into the water by the force of the ice within the interstices of the stone. The winter had been mild, and during a rapid thaw a considerable stream had welled up from the ice-covered summit of the fjæld, and carried its waters into every crevice of the rock, when a sudden change of wind brought about a sharp frost, which turned the descending waters of the newly formed stream into ice, arresting their course within the interstices of the rock. The result was the explosion of the entire mass of the fjæld below the outbreak of the stream, and its projection from a hight of more than 1,500 ft. into the neighboring fjord, which ingulfed the whole of the promontory with its cultivated fields and farmstead. Simultaneously with the disappearance of the land below the surface of the fjord a huge mass of water was propelled against the opposite shore, carrying with it rusty anchors, boat rafters and numerous other objects which had long lain at the bottom. The disturbance extended a mile beyond the point at which the land was submerged, and the waters in retreating carried with them a wooden church which had stood 50 ft. above the fjord, besides sweeping away all the fishing boats for a distance of two and a half miles. Before this occurrence, which was attended by loss of life to about a score of persons, the headland had been much resorted to on account of the halibut which abounded in the neighborhood, but since that period the fish has never returned, a circumstance which, according to local popular belief, is due to the covering up by the infallen rock of certain submarine cavities and springs frequented by the fish.

Mental Distance of the Moon.

M. Plateau lately sought to estimate the distance to which the moon is mentally referred in the sky, by getting some one, after looking at that body, to project the accidental image on a wall, then move to or from the wall till the diameter of the image seemed equal to that of the moon; and he obtained the distance 51 meters. Again, Prof. Thirion, of Namur, got twelve students to draw on a blackboard a circle the size of the moon as it appeared to them. The circles varied from 19 to 79 cm., mean 32 cm., and it was inferred that the moon was mentally referred, on the average, to about 35 meters. Dr. Charpentier, by still another method, obtains the value 12.9 meters, so that there are great differences, and in any case the distance is much less than might have been thought. M. Plateau has, says *Nature*, further applied accidental images to finding the distance to which the imaginary celestial vault is referred. A spot in a white square of paper on a dark ground was looked at steadily at the side of an open window for twenty seconds, then the person looked skywards, above the opposite houses, then to one of these houses, and compared the size of the accidental images in either case. The sides of the two were by one person estimated as 5 to 6, by another as 4 to 5; and the width of the street being about 30 meters, the distance assigned to the celestial vault is inferred to be in one case 30, in the other 29 meters. A similar result was got by night.

Improved Lenses for Telescopes.—A Georgian of scientific attainments, residing at Darien, thinks he has discovered that lenses for telescopes can be manufactured from the virgin drip of resin. The largest lense made of glass is only 30 inches in diameter. This magnitude can be greatly increased by the new method, and, consequently, there is no telling what wonderful astronomical results may flow from its adoption. The main difficulty is in securing a favorable opinion at headquarters here. I have called the Hon. George R. Black's attention to it, and he has promised to see Prof. Baird and urge him to make or have made competent investigation. My Darien correspondent is unfortunately not situated for pushing his discovery, and I can only aid him with my pen and tongue. He reminds me, and I repeat it for public edification, that no less a person than Mr. Calhoun stood in the way of Prof. Morse's electric telegraph, and Mr. Stephens says that he was the only Southern Congressman who stood by Morse through thick and thin. Gentlemen who are conversant with science assure me that the Darien discovery is worthy of a thorough test, and, as it will not cost much to make it, I hope this notice may meet the eye and open the purse of some man or woman, who thereby stands a reasonable chance of being connected with a tremendous possibility.—*Washington Letter.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Mar. 16		Week Ending Mar. 23		Week Ending Mar. 30		Week Ending Apr. 6.	
Alpha	1⅛	1.10	1⅛	80c	80c	55c	50c	35c
Alta	3.40	2 55	3.15	2.90	3.10	2.15	3.05	2
Andes	75c	45c	85c	70c	75c	65c	55c	50c
Albion	3.45	2.60	3.20	2.95	2.80	2.20	2 90	2.30
Argenta	....	....	10c	....	30c	....	10c	....
Addenda	5c	....	10c	....	15c	10c	15c	....
Belcher	75c	55c	60c	50c	55c	45c	50c	45c
Belmont	50c	....	....	....	....	....	....	....
Best & Belcher	6⅛	6	6⅝	6	6⅛	5⅝	5¼	4.30
Bullion	75c	70c	75c	55c	50c	25c	30c	20c
Bechtel	35c	....	35c	30c	30c	....	30c	....
Belle Isle	....	....	....	....	....	....	....	....
Bodie	4.55	4.20	4.45	4⅛	6	4.65	5⅜	42
Benton	45c	35c	45c	40c	45c	25c	40c	20c
Bulwer	1⅛	....	2.10	2	2⅛	....	....	....
Boston	....	....	50c	....	50c	....	40c	30c
Black Hawk	10c	....	....	....	15c	10c	10c	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	....	....	....	....	5o	....	....	....
California	35c	30c	35c	25c	30c	15c	15c	10c
Challenge	....	....	....	....	....	....	15c	....
Chollar	1.20	1.10	1.20	1.05	1.20	1.05	1.10	65c
Confidence	1.90	1	80c	60c	75c	60c	50c	....
Con Imperial	10c	5c	10c	5c	5c	....	....	....
Con Virginia	90c	75c	90c	75c	80c	60c	60c	50c
Crown Point	35c	20c	45c	25c	45c	40c	45c	43c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	80c	75c	1	....	1.55	1.60	2.60	2¼
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	25c	....	....	....	35o	30c	30c	....
Dorhec	....	....	....	....	....	....	....	....
Day	1⅛	1.40	1⅛	1.35	1.95	1.40	3.65	1.90
E. Mt. Diablo	25c	20c	25o	20c	20c	15c	20c	15c
Eureka Con	23	19	24	19½	23⅜	21⅜	22⅝	20
Exchequer	50c	40c	45c	40c	35c	25c	25c	15c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	35c	....	25c	....	50c	30c	45c	35c
Gould & Curry	3.30	3.10	3.55	3.05	3.20	3	3.35	1.95
Hale & Norcross	1.30	1.05	1.20	1.05	1.05	90c	90c	60c
Head Center	....	....	....	....	....	....	25c	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	20c	....	15c	10c	10c	....	15c	10c
Justice	75c	55c	70c	55c	60c	50c	55c	40c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	....	25c	20c	30c	25c	25c	20c
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	5c	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	45c	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	1⅛	....	1⅜	....	1¼	....
Martin White	7⅛	7	6¼	5⅞	8	7⅛	7⅛	....
McClinton	....	....	....	....	....	....	....	....
Mono	1⅛	1⅛	1⅛	1⅛	2.40	1.85	2	1.65
Mexican	8⅜	8¼	6¾	7¼	7⅜	6⅜	6¼	4.65
Mt. Diablo	6	....	6	5¾	5¾	4⅜	5	4¼
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	1.05	40c	1¼	90c	1.70	1.40	1.45	1
New York	....	....	....	....	5c	....	....	....
Northern Belle	9¼	9¼	9	8⅝	8⅝	8¼	8	77
North Noonday	75c	50c	1⅛	70c	1⅛	1.45	1.35	85c
Navajo	30c	....	35c	30c	1	45c	80c	65c
Occidental	75c	70c	75c	....	80c	....	80c	70c
Ophir	3.65	3¼	3.65	3.10	3.05	2.80	2.60	1.90
Original Keystone	....	....	....	....	....	....	....	....
Overman	45c	35c	35c	30c	30c	25c	25c	15c
Oro	40c	30c	40c	30c	55c	45c	50c	40c
Paris	....	....	....	....	1	50c	....	....
Potosi	1.05	1	1.15	95c	1	90c	90c	55c
Queen Bee	....	....	....	....	5c	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.20	1	1.20	90c	95c	80c	80c	55c
Seg Belcher	1⅜	1⅛	2¼	1.85	1¼	....	1⅛	1⅛
Sierra Nevada	7⅞	7⅜	7⅝	7	6⅞	6⅜	6¾	5
Silver Hill	....	....	15c	....	15c	....	15c	10c
Silver King	18	17⅜	17⅛	17⅛	17⅜	17⅛	17	16
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	25c	10c	20c	10c
Scorpion	80c	65c	90c	70c	75c	65c	65c	45c
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	45c	35c	35c	30c	40c	30c	35c	30c
Tioga Con	20c	....	25c	20c	40c	25c	30c	25c
Tiptop	5	....	4.60	....	4¼	4	4	3¼
Tuecarora	....	....	....	....	....	....	....	....
Union Con	11⅜	10⅜	11⅜	10	10⅜	9⅜	9⅛	8
Utah	4¼	4.35	4.65	3.80	4	3.70	3.70	2.60
Ward	3¼	....	3¼	....	3¼	3	3¼	....
Wales	55c	....	60c	55c	60c	50c	60c	....
Yellow Jacket	1.45	1.10	1.05	1	1.10	95c	1	90c

Sales at S. F. Stock Exchange.

Thursday A. M., Apr. 6

50 Alpha 40c
2615 Alta ..... 3@3.05
500 Andes 55c
170 B & Belcher ..... 4.60@4.65
105 Belcher 50c
430 Bullion ..... 25@30c
1300 Benton ..... 40@35c
850 California 10c
400 Con Virginia ..... 85@90c
550 Chollar ..... 85@90c
500 Gould & Curry ..... 3.30@3.35
405 Hale & Nor 80c
915 Justice ..... 50@55c
200 Mexican 5⅞
1225 Ophir ..... 2.20@2.25
30 Overman 25c
345 Potosi ..... 75@80c
785 Savage 65c
255 Sierra Nevada 5⅞
300 Scorpion 70c
200 Utah ..... 3.15@3.10
765 Union ..... 8⅞@9
60 Yellow Jacket 95c

AFTERNOON SESSION.

130 Albion ..... 2.90@2.95
100 Atlas 2.20
180 Bodie 5⅛
10 Bulwer 2⅛
100 B O'Neill 1
200 Bodie Tunnel 1.05
50 Bechtel 90c
50 Concordia 2¼
350 C Pacific 30c
400 Day 1.85
200 E Mt Diablo 15c
150 Goodshaw 45c
500 Holmes 10c
150 Mono 1⅞
100 Navajo 80c
540 Noonday ..... 1.20@1.15
280 N Noonday 1.10
1150 Oro 40c
90 Southern Nev 5⅛
470 Standard 3.05
100 Silver King 16⅛

Bullion Shipments.

We quote shipments since our last, and shall he pleased to receive further reports :

Standard, March 28th, $25,755; Eureka Con., 26th, $10,330; Christy, 28th, $2,341; Northern Belle, 30th, $6,743; Christy, April 1st, $4,758; Contention, March 28th, $13,000; Bodie, April 3d, $8,740; Tip-top, 1st, $23,500; Star, 1st, $1,657; Christy, March 31st, $2,484; Contention Con., 2d, $20,000. Derhec Blne Gravel, total for March, $14,292.78; Bodie Tunnel, 4th, $2,750; Noonday, 28th, $6,751.29; North Noonday, 28th, $7,823.87; Eureka Con., 28th, 29th, 30th, 31st, $20,033.99. Germania, 28th, $2,820; Hanauer, 28th, $2,950; Horn Silver, 30th, $7,500; Mammoth, 31st, $1,029; Germania, 31st, $5,200; Hanauer, 31st, $3,015; Horn Silver, 31st, $2,500; Barbee & Walker, 31st, $1,473; Horn Silver, April 1st, $10,000; Mammoth, 1st, $824; Silver Reef district for March, $39,502. Receipts of Treasure at San Francisco, through Wells, Fargo & Co.'s Express, during the quarter ending March 31st, were $8,391,300, against $8,836,200 in the same time in 1881, $9,975,500 in 1880, $13,519,200 in 1879 and $20,418,500 in 1878. Last quarter's receipts consisted of: Dore silver, $2,203,100; gold bars and dust, $2,243,700, and ooin, $3,944,500.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Albion Con M Co	Nevada	10	30	Mar 6	Apr 10	May 2	D B Chisholm	327 Pine st
Alpha Con M Co	Nevada	16	50	Mar 20	Apr 26	May 19	Wm Willie	309 Montgomery st
Belmont M Co	Nevada	31	15	Mar 11	Apr 17	May 15	J W Pew	310 Pine st
Belvidere M Co	California	13	25	Feb 9	Apr 12	May 1	C V D Hubbard	310 Pine st
Benton Con M Co	Nevada	7	25	Mar 10	Apr 14	May 4	Wm H Watson	302 Montgomery st
Bullion M Co	Nevada	23	30	Mar 29	May 2	May 25	J M Brazell	328 Montgomery st
California M Co	Nevada	3	20	Mar 29	May 6	June 5	G P Gordon	309 Montgomery st
Con Virginia M Co	Nevada	17	50	Jan 31	Mar 11	Apr 8	A W Havens	309 Montgomery st
Crown Point G & S M Co	Nevada	47	25	Feb 16	Mer 23	Apr 13	J Newlands	327 Pine st
Day S M Co	Nevada	10	50	Jan 28	Mar 6	Apr 3	E M Hell	327 Pine et
Fall Creek M Co	California	5	30	Feb 16	Mar 24	Apr 19	W Willis	309 Montgomery st
Goodshaw M Co	California	10	10	Mar 21	Apr 22	May 11	C C Harvey	309 Montgomery et
Hale & Norcross S M Co	Nevada	73	50	Mar 14	Apr 13	May 10	J F Lightner	309 Montgomery et
Independence M Co	Nevada	9	15	Feb 24	Mar 31	Apr 24	E M Hall	327 Pine et
Iowa M Co	Nevada	16	03	Mer 8	Apr 15	May 6	C C Leavitt	411½ California st
Mayflower Grav M Co	California	15	10	Mer 7	Apr 11	May 3	J Morizio	328 Montgomery st
McMillen M Co	Arizona	4	30	Feb 8	Mar 14	Apr 12	J Morizio	338 Montgomery st
Mexican G M Co	Nevada	18	1 00	Mar 13	Apr 15	May 9	C L McCoy	309 Montgomery st
Modoc Con M Co	California	10	30	Feb 14	Mar 28	Apr 25	J W Pew	310 Pine st
Napoleon M Co	California	2	03	Feb 18	Mar 23	Apr 8	H Smith	309 Montgomery et
Niagara G & S M Co	Nevada	6	20	Apr 1	May 3	May 25	O C Miller	409 Montgomery et
North Gould & Curry G & S M Co	Nevada	2	20	Mar 18	Apr 19	May 11	C H Mason	331 Montgomery st
Opbir S M Co	Nevada	41	1 00	Mar 7	Apr 8	May 2	C L McCoy	309 Montgomery st
San Jose M Co	Nevada	18	75	Jan 30	Mar 15	Apr 19	A Cerrigan	109 Front et
Savage M Co	Nevada	50	50	Mar 7	Apr 10	May 1	E B Holmes	309 Montgomery st
Scorpion S M Co	Nevada	11	10	Mar 9	Apr 13	May 4	G R Spinney	310 Pine et
Seg Belcher M Co	Nevada	21	1 00	Feb 14	Mar 20	Apr 10	G D Edwarde	414 California st
Sierra Nevada S M Co	Nevada	72	1 00	Mar 23	Apr 26	May 15	E L Parker	309 Montgomery st
Silver Lick Con M Co	Nevada	1	05	Mar 29	May 6	May 27	L J O'Farrell	Montgomery Block
Silver Belt M Co	Arizona	1	15	Mar 8	Apr 17	May 15	J W Pew	310 Pine st
Tellurium G & S M Co	California	26	10	Apr 1	May 3	May 24	E P Roeb	431 California st
Union Con S M Co	Nevada	19	1 00	Mar 21	Apr 25	May 15	J M Buffington	309 Montgomery et
Utah S M Co	Nevada	38	1 00	Mar 11	Apr 14	May 3	G C Pratt	309 Montgomery st
Yellow Jacket S M Co	Nevada	44	1 00	Feb 7	Mar 4	Apr 11	M Otey	327 Pine et

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Bay State S M Co	Nevada	1	02	Dec 29	Mar 31	Apr 24	J W Pew	310 Pine et
Bed Rock M Co	Arizona	1	05	Feb 6	Mar 13	Apr 3	C H Graves	6 Post st
Caborca M Co	Mexico	5	30	Feb 25	Mar 29	Apr 17	W L Elliott	220 Sansome st
Equator M Co	—	—	20	Feb 27	Apr 11	May 9	Wm Willie	309 Montgomery et
Metallic M Co	—	—	20	Feb 27	Apr 11	May 9	Wm Willie	309 Montgomery st
Metallic-Equator M Co	—	—	20	Feb 27	Apr 11	May 9	Wm Willie	309 Montgomery st
Pinal Copper Co	Arizona	3	2 50	Jan 28	Mar 20	Apr 10	Geo T Shaw	340 Fourth et
San Pedro G & S M Co	California	4	03	Feb 27	Apr 3	Apr 27	W G Holmes	rm 1, Sherman'sbuild'g
Wide Awake P & M Co	Arizona	16	10	Mar 17	Apr 29	May 25	C Hilderbrandte	cor Bush & Kearny

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Bulwer Con M Co	California	Wm Willie	309 Montgomery et	Annual	Apr 12
Hope Con M Co	——	F S Monroe	331 Kearny st	Annual	Apr 13
McElroy G M Co	California	Lewie Lillie	607 Washington st	Special	Apr 17
Republic M Co	——	Wm J Taylor	310 Pine st	Annual	Apr 18
Sigourney G & S M Co	——	A Judson	320 Sansome et	Special	April 15
Tioga Con M Co	——	Wm H Lent	309 Montgomery st	Annual	Apr 10

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willie	309 Montgomery et	10	Apr 12
Contention M Co	—	D O Bates	309 Montgomery st	25	Feb 28
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery et	50	May 15
Silver King M Co	Arizona	J Nash	315 California et	25	Mar 15
Standard Con M Co	California	Wm Willie	309 Montgomery st	75	Mar 13

The Mining Share Market.

As usual, very little doing in stocks. The principal item of interest has been the proceedings of the meeting held this week among the managers and superintendents of the flooded Gold Hill mines, to devise ways and means of extracting the water and resuming explorations. There were present representatives of the Bullion, Exchequer, Alpha, Imperial, Yellow Jacket, Crown Point, Belcher, Ovorman and other companies. Colonel C. L. Weller, of the Crown Point company, presided as Chairman. W. H. Patton, superintendent of the north end mines, whose judgment and advice had been requested in the matter, presented a chart of the underground workings of the flooded mines, and gave some statistics to show the quantity of water which now fills them. The present daily influx amounts to 1,900,000 gallons. The Yellow Jacket pumps have a capacity for extracting 1,382,000 gallons per day. He suggested that the Belcher and Crown Point pumping machinery he moved to the Ward shaft. This would increase the pumping capacity to 3,000,000 gallons per day, to say nothing of the hailing facilities. If this were done, the water could he extracted down to the 2700 foot level in a time not to exceed six months, and at a cost not to exceed $500,000, which could he divided among the ten or more companies in just proportion. It would cost about $20,000 to move the Belcher and Crown Point pumps. They could he purchased, he thought, for about $150,000, and the cost divided, Crown Point and Belcher to receive oredit therefor, etc. On being asked if he did not think a hydraulic pump at the Yellow Jacket shaft would do the work better and cheaper, Mr. Patton said that it was a mistaken idea that hydraulic pumps were more economical and better for general mining uses than the Cornish pumps. In proof of this he said that the Cornish pump at the Union shaft does as much work on a consumption of three cords of wood as does the hydranlic pump at the Combination shaft on four cords. The hydraulic pump was impracticable for sinking and general mining. A committee, consisting of Messrs. Patton, Taylor and Foreman, was appointed to draft a plan for submission to the different companies. The repoit will probahly he made within two weeks. From all that could he observed, the mine managere mean bnsiness, and their efforts will he appreciated by the puhlic. In the course of his remarke, Mr. Patton spoke very favorahly of the showing for a new honanza in the north end.

THERE were several Black Range men in the city yesterday. They give good accounts of the mining interests down there, and do not believe that there is a hostile Indian in the country. The miners are highly pleased at Prof. Sileman's account of the country, delivered at the American Institute of Mining Engineers at the recent meeting in Washington. They say that they have the "stuff" and are glad that the fact is hecoming known in the East.—*Silver Brick, N. M.*

Academy of Sciences.

The regular meetiog of the Academy of Sciences was held on Monday, and the following life members were elected: John F. Boyd, Hermann Schussler, John W. Ackerson, Daniel E. Hayes, W. S. Keyes, James H. Goodman, Jacob Z. Davis; and resident members: Prof. Wm. T. Reid, President of the University of California; Prof. J. J. Rivers, Prof. Henry A. Ward, M. H. Hecht and Thomas Brown. The followiog donations to the musenm were presented: From R. H. Stretch, petrified wood and leaves; from Col. Batchelder, U. S. Depot Quartermaster, a large hlook of stone, in which are imhedded large animal bones, found on the Encino rancho, Los Angeles; from James Melrose, obsidian arrow point, from north side of Napa Valley; from W.G. W. Harford, a large horned toad; from Dr. H. W. Harkness, a pandelus, or large-sized speoies of prong-like animal from Anaheim; from Mrs. M. H. Metrose, a fine collection of four-stone mortars and pestles from Livermore valley; from Mrs. Hostetter, of San Jose, a mass of post-pliocene cretons, or sea shell eet in hard sandstone, found in the mountains; from W. T. Notie, a deer's head mounted. A large number of exchanges and donations to the library were received.

An official communication, incloeing a reeolution from the Board of Snpervisors, was read, requesting the Academy to make an investigation of the question of sewer-gas, reporting upon it hy lectures to be pnhlicly delivered, or hy manuscript report, reviewing its engineering, microscopic and chemical conditions, and bearing upon the present exceptionally high death-rate; provided, however, that all this be done without cost or expense or expenditure of any kind or natnre whatsoever to the city. The committee appointed to consider the matter consisted of Col. Geo. E. Gray, Dr. H. Herman Behr and Justin P. Moore, who were given power, if necessary, to add to their nnmber.

Dr. H. W. Harknese reported the receipt of a very curiously colored deposit, which had been found precipitated in a hottle of Mono lake water, which was taken from the lake over a year ago, and hae stood perfectly still since that time. He gave notice that he should read a paper upon it at the next meeting, and would illustrate it by the use of microscopes.

The matter of the presentation of the Ward collection to the Academy hy Messrs. Crocker and Stanford, is referred to in another colnmo.

THE complete results of 10 days' run of the Philadelphia Mining and Smelting company's plant at Ketchnm, Wood River, Idaho, were $23,245.50 in silver bullion, $9,395.82 in lead, and $541.80 in gold hars. The smelter will resume operations ahout the middle of May.

THERE is every indication that the price of lead will keep up, and there will be great demand for lead ores in the Salt Lake market this season.

MINING SUMMARY.

The following is mostly condeneed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

BUTTE.

DEER CREEK MINES.—Butte *Record*, April 1: Myron Dorn, John L. Jones, Charley Jennings and Joe Baxter arrived in Chico this morning from the Deer Creek mines. They left the mines early yesterday morning and walked to Vina, a distance of 30 miles, ou the old Deer creek trail. The mines here closed down until the 1st of May. It was impossible to get provisions to the mines, except hy pack-mules or on snow shoes, and by that way food would he too dear. Mr. Dorn informed a *Record* reporter that 15 men bad heen kept steadily at work in the mines during the past three months. Two "giants" have been constantly used, and a fair clean-up has been made. There ie a good water supply for these mines from Butta creek, which flows the year round. The great difficulty to overcome is a bed of lava, from 15 to 20 ft through, which covers a rich stratum of pay gravel. Work during the winter has been confined principally to the Lava Queen claim, but when operations begin again in May a three-mile flume will be built to the Jackson mine, and the working force will be largely increased. These mines are under the management of Mr. George C. Spooner, a miner of considerable experience. The mines are owned hy a company of Boston capitalists, who have sunk large sume of money in their claime. It ie thought by some that the mines are worthlees, hut an old miner informed a reporter this morning that, in his opinion, they are rich and would shortly develop into a bonanza for their owners. It waa rumored in town that the company bad suspended and refused to pay their employees any wages due them, hut inquiries at the bank of Chico this afternoon prove the reports to be false, as the company is a reliable one and pays all debts promptly.

CALAVERAS.

DITCH REPAIRING.—Calaveras *Chronicle*, April 1: The canal of the Mokelumne & Campo Seco Water Co. is agaln carrying a full head of water. The last storm, which was an unueually severe one, caused heavy land slides in the mountains, doing no small amount of damage to ditch property. In the Water Co.'s ditch no very serious breaks occurred, but a number of slides took place, filling up the ditch and cutting off the supply of water for a number of days. One slide so filled the canal with soil and huge rocks that it took 20 men 4 days to clear it. All thie, of course, interfered with those mining operations which are dependeut on this source for their water supplies. Everything is now in order and runuing, and it is not likely that any more such delays from the same cause will occur again this season.

EURREA AND PINE PEAK MINES.—The Cook Broe are making a very successful run at their Eureka mine. With 600 inches of water, under a high pressure, working hoth day and night, they have succeeded in removing a large body of gravel. At preeent they are running hottom dirt and hreaking ledge preparatory for a clean-up, which, judging hy present indications, will be a bonanza. Their Pine Peak mine is developing to their entire satisfaction, and will doubtless prove to be one of the best properties in the county. We are creditahly informed that the Cook Bros. are now at work on a canal to convey water from the Mokelumne river to the Pine Peak country, and will this spring put on a large force to accomplish this object. Had we a few more such energetic men in the community many of our mines now abandoned would be running.

LEG BROKEN.—A mining expert from Oakland had his leg broken by falling about 20 ft down the shaft of the Lone Star mine, near Wcet Point, one day last week.

EL DORADO.

CLIPPER.—Georgetown *Gazette*, March 31: Work has been started on the Clipper quartz mine, under the superintendence of Mr. Powning. The water has just been pumped out, and the mine is being put in shape for etarting up the mill and extraction of ore. Under the management of Mr. Powning, we are confident that the Clipper will he made to pay handeomo dividends. This mine is about three miles northeast of town.

ARGONAUT.—Supt. Hopkins, of the Aultman M. & M. Co., and Mr. John Smith, one of the late owners of the Argonaut mine, near Greenwood, were in town Thursday. The ten-etamp mill on the Argonant is now running day and night.

INYO.

DEEP SPRINGS.—Cor. Inyo *Independent*, April 1: This well known mining district is not in its feet throes of death, but is steadily coming to the front with its vast mineral resources. Mr. James Croes, a mining man of vast experience throughout the Pacific coast, accompanied hy a wealthy capitalist from San Francieco, paid the district a visit last week, examining propertiee. The Half Dollar owners are sinking their shaft at a lightning speed, and winding up the company's business at the preeent depth is no easy task. M. J. Byrnee is making exteneive preparations to resume work on the Trade Dollar. Mr. Elise, of the Mayrock, has struck a fine bunch of high-grade metal. The Oriental mine, engineered hy Messrs. Jordan and Black, is looming into prominence. The prospecta for a general boom in this section are favorahle. You have had your Bodie, Bodie, Tombetone, and snide stock boom on the Comstock, but ours will assume a different shape. It will he hullion conetantly hooming out of the district.

NEVADA.

THE PUMPING MACHINERY.—*Tidings*, April 1: A *Tidings* reporter visited the Idaho mine recently for the purpose of seeing the new pumping engine at work. The machinery was found working eo noiselessly that when one's back is turned he could scarcely believe he was eo near a ponderous engine pumping water from a gold mine 1,300 ft in depth.

THE EMPIRE.—The Empire mine is now taking out quartz from the 5, 9, 10, 11 and 13 level', the 13-level producing, hesides good milling ore, some very rich specimens. The 13-level has 200 ft of tracke, and the pay chute pitches south.

FORD AND MULLEN.—The Ford and Mullen company, located on New York hill, are having a crushing of 30 loads put through Southern's mill. It is estimated by competent judges that this will go $150 to the load. Rich specimens are still coming out of this mine.

EAST EUREKA.—Work will he commenced on the East Eureka, or O'Connor mine, on Monday next. Twelve men, all tributers, will sink down upon the ledge and take out rock for crushing. Experienced millwrighte are now making estimatee for putting the mill in repair, and work to that end will soon he commenced.

THE WASHINGTON.—The Washington mine, which has been idle for about three months, will etart its machinery on Monday, and commence the work of pumping out the shaft, which, it is thought, will take but a ehort time, as the pumps and machinery are all in first-class running order. The machinery at the Washington was inefficient, at first, to do the work required of it, but now it has been reinforced eo ae to meet all demande upon its power. Ae eoon as the water is out drifting will be commenced on the 250 level.

KNIGHTS OF MALTA.—This property has been lying idle for eome time, hut we are informed that New York capitalists will handle it this season. The last rock taken from the mine was of excellent quality, and eome of it may be seen at Moore's blacksmith shop on lower Mill street.

MAMMOTH CONSOLIDATED.—The Mammoth Consolidated mining company have organized, J. G. Jones, President; H. Davis, Secretary; Board of Directors, J. I. Meek, A. P. Tietjen and John Lnuday. The company will commence operations at an early day on the several ledges.

NEW YORK HILL.—Work at the New York Hill is going steadily along, no new developments being made since our last report.

NAPA.

THE MINES.—*Calistogian*, April 3: The weather has been unfavorable for miners to travel from town to the mines and back, consequently little prospecting has been done and no new developments of importance made, either at the surface of the ground or under it. Work has been discontinued in the north and south drifts on the 150 level of the Twin mine, in order to drift north and south on the vein at the 100 level, or each way from the end of the discovery tunnel and at the top of the shaft. This course has been considered advisable to further prove the vein at that depth, though there is scarcely a doubt but that good ore will be found in abundance. The lower drifts, above referred to, were discontinued because it was not considered necessary to prospect the vein further there at present. The faces of the drifts were in good milling ore when work was discontinued, and good ore was found the whole distance passed through. The Bonsalle are anxious to have the shaft sunk 100 ft deeper to further prove the vein, but as the work is paid for now by those who have bonded the mine, and who also give orders, this course may not be pursued at present, though the shaft will, no doubt, be sunk deeper in the near future, especially after a mill has been erected. J. J. Johnson will soon recommence work in the shaft on the Old Discovery (formerly Palisade) claim. This shaft is located a few yards a little east of north from the entrance to the discovery tunnel of the Twin mine, and is at present down a distance of 40 ft.

PLACER.

YANKEE JIM'S.—Cor. Placer *Herald*, April 1: The "beautiful snow" is entirely gone, and hydraulicing has commenced. The Georgia Hill M. Co. and the Gilbert boys are washing. Both claims are working a small force of men. The St. George M. and M. Co. have suspended work for the present. The Napoleon mine is putting on quite a strong force. I understand they are getting up a new crushing mill, which, according to all reports, will be on the ground to-day or to-morrow. A new mine, the "Bald Eagle Tunnel," about one-half mile east of this place, has recently been opened. They will work only two or three men until they get the tunnel open; then, I believe, they are to put on a larger force.

PLUMAS.

RICH QUARTZ.—Plumas *National*, April 1: From Mr. R. E. Garland we learn that a strike of exceedingly rich quartz was made in the tunnel of the Taylor Plumas mine at Crescent last week. The mine is owned by an incorporation, Mr. M. B. Bransford being in charge of the work. Garland says they brought out a candle-box full of quartz which "was more gold than quartz." They have been getting rich rock there all winter, but nothing like the present bonanza. The owners are jubilant over their good prospects, as well they may be. Send us a good cabinet specimen, M. B.

NEWTOWN FLAT.—We were shown, the other day, a clean-up from a small pile of pay-dirt washed from the claim of Leavitt & Brown, at Newtown flat. The gold was nearly all coarse, exactly like that which comes from the Manson & Corbin claim in Elizabethtown. The amount was about $117, and there was not more than $20 in fine gold, the balance being in pieces weighing from one dollar to an ounce. They certainly have the regular lead gold, and it is also certain that they have a very extensive deposit of it. When the water season is a little further advanced they will make some clean-up that will be worth looking at. There is lots of dust in that country, and much of it will come to light this summer.

SHASTA.

FROM WHISKEYTOWN.—Cor. Shasta *Courier*, April 1: As we meandered through the classic precincts of Whiskeytown and arrived on Main street on an afternoon of last week we observed an unusual bustle and stir. On inquiring as to the cause, we were directed to Woodward's hotel, where we discovered Messrs. Zent & Eastman with hats off and sleeves rolled up, deeply interested in a mortar, pan and a chunk of gold that weighed $1,100. All told, that afternoon they got over $1,000 in 2 hours' work. Since then they have been getting $100 or $200 a day. Their find is situated about 1 mile northeast of town. It will undoubtedly revolutionize prospecting in this part of the country. There is a ledge of slate, heavily timbered with iron, running northeast and southwest for miles, and it has been known that all the gulches fed from this have been very rich, but it has been left for Zent and Eastman to find a pocket where a stringer of quartz butted an elbow of the iron or slate ledge. Some think from mountain ie a continuation of this ledge. Everybody is prospecting now; miners, mechanics, merchants, clerks, boys, dogs, and even the school master has been sent on the war path. A number of good prospects have been found, but we believe Mr. Banghart's, of $1.50, is the best so far. Whiskeytown has not been dead, only sleeping.

GOLD.—A few weeks ago Bonham, a miner on Flat creek, found a piece of gold of 12 ounces, and this week Frank Joseph found in his claim a piece about 3 inches long, 1½ inches wide and half inch thick, mixed with quartz and containing about 5½ ounces of gold.

OLNEY CREEK, southeast of town, on which so many "big strikes" were made in times past, was prospected in 1854 by J. O'ney, Geo. Joseph Lane and Robert Scott, brother of our townsman, J. V. Scott. Major Reading also mined on the creek in the spring of 1852 for a short time. The stream was named after Olney.

ELECTRIC MACHINE.—Mr. Howell, proprietor of an electric machine for the discovery and location of gold and other mineral, is now operating in this county. The machine is said to work wonders in the way of indicating where deposits of gold and silver lie, and it might be a good plan for the Assessor to use the instrument in his business with our capitalists.

SIERRA.

SCALES DIGGINGS.—Cor. Sierra *Tribune*, March 30: I. P. Lloyd came down from the Iowa shaft to-day. He says there is about ten feet of snow on the level at the shaft.

SIERRA BUTTES.—No. 0 tunnel of the Sierra Buttes mine is shut down on account of a lack of water in the ditch above. The Bald Mountain company has an abundant supply of water at present for washing purposes, thanks to old Sol. H. Raymond was down from the Seventy-six mine last Monday. He says there is about 12 ft of snow at the Pliocene shaft. No damage was done at the Savage mine during the recent storm. Several slides had occurred at the mine, but fortunately they missed the buildings.

NEVADA.

WASHOE DISTRICT.

UNION CONSOLIDATED.—Gold Hill *News*, April 3: East crosscut No. 1 on the 2700-level has been extended 20 ft, and north drift No. 3 has been advanced 25 ft. The joint Sierra Nevada east winze has been sunk and timbered 10 ft. In the main south lateral drift are easing timbers. During the past week there have been extracted from the 2500 and 2700-levels 315 tons and 1,300 lbs of ore.

SIERRA NEVADA.—On the 2500 level the winze in east crosscut No. 2 has been sunk and timbered 10 ft; north drift No. 2 has been advanced 27 ft, and the main north lateral drift 32 ft. On the 2700 level, main north lateral drift No. 1 has been extended 20 ft, and north drift No. 3 has been advanced 25 ft. Joint Union Consolidated east winze has been sunk and timbered 10 ft.

OPHIR.—Are cutting out a drain in and timbering up the main south drift on the 2700-level. On the 2900-level the main south lateral drift has been extended 25 ft. During the week 130 tons and 400 lbs of ore have been extracted from the croppings, and 438 tons and 130 lbs have been sent to the mills.

FOREST.—The southwest crosscut was advanced 50 ft; total length, 168 ft. The ground passed through has been quartz and clay, which was soft and required timbering. On Friday night about an inch and a half of water was struck in the face of the drift.

HALE & NORCROSS.—The northwest drift, 2500-level, has been advanced 30 ft during the week; total length of drift, 429 ft. Have started a drift running north at 165 ft from winze, which is now in 27 ft.

GOULD & CURRY AND BEST & BELCHER SHAFT.—On the 2300-level the Best & Belcher northwest drift was advanced 45 ft; total length, 610 ft. The joint shaft was sunk and timbered 56 ft; total depth, 2,235 ft.

MEXICAN.—On the 2700-level the main north lateral drift has been extended 28 ft, and the main south lateral drift the same distance. On the 2900-level the main north lateral drift has been advanced 27 ft.

CONSOLIDATED VIRGINIA.—On the 2500-level south drift No. 2 has been extended 31 ft. On the 2700-level the south drift drill-hole has been advanced 150 ft.

UNION SHAFT.—Are putting in a pump-bob at the 2600 station and repairing the 1600 drift to the Mexican and Union Consolidated winze.

UTAH.—Timbering and repairing at the head of the incline. On the 2500-level the main south drift has been advanced 22 ft.

CHOLLAR.—The west drift was run 40 ft; total length, 106 ft. The ground in the face is the same as reported last week.

CALIFORNIA.—On the 2700-level the main south lateral drift has been extended 20 ft.

BRISTOL DISTRICT.

MONITOR.—Bristol *Times*, March 25: The Monitor mine, owned by Bob Wilson, gradually grows more valuable as work progresses. It is thought that this will one day become one of the richest mines of the district.

ORE.—Teams will soon be put on hauling ore from the Day mine to the furnace, which will be started up some time next month. The way the Day looks now, there is enough ore in sight to keep four stacks running for years. The ore in the Mayflower is still coming in big, but not quite of as high a grade as formerly, though the showing is larger than at any time heretofore, and enough ore is in sight to keep the mill in constant operation for years.

MILL.—The Bristol company's mill started up again last Saturday, after a stoppage of a few days on account of an insufficiency of water, but now have a plentiful supply on hand, and everything is in and about the mill in ship-shape order. Mr. Goodhue, of the Bristol S. M. Co., informed us that he will sink another 100 ft so as to overcome the inconvenience attending the lack of water. Work will be commenced as soon as pumps arrive, and it is hoped that the difficulty will thereby be done away with.

DAY.—We have been informed that the crosscut running east from the bottom of the shaft in the Day encountered a huge body of ore not more than 20 ft from the drift. We have, as yet, been unable to learn anything authentic concerning this late strike, but suppose that it must be on the 700—the tapping of the bonanza on the 620.

MACHINERY.—J. T. Gilmer and O. J. Sallebury were here all last week, taking a look at their different mining properties, and are more than well satisfied with the showing. Men have been put on on both the Iron and Tempest mines, and developments will be prosecuted with all possible speed. Many tons of machinery for these two mines are on the road from San Francisco, and ought to arrive here some time this coming week.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, April 1: Work in the main shaft has consisted of completing the timbering and putting in the guides, enabling the hoisting of the cage to the fifth shaft level. At this point the station is completed, and a drift started to connect with the main winze now being sunk from the fourth level. This winze is now down 137 ft on an incline. The adit and the levels above show very little change, but keep up the usual production of ore. The daily yield of ore has been about 50 tons. Bullion shipments for the week ending March 30th have been $15,739.70, and a total of $58,847.72 on March account to the same date. One more shipment remains to be made on last month's account.

MOUNT DIABLO.—The stopes above the east drift on the third level are showing improvement, and the one below the north crosscut on the same level, in the west drift, is looking much better. The stope from the west winze, on the second level, continues to show well, and that near the center of the mine, on this level, opens well and is yielding considerable high grade ore. The old workings have been broken into from the foot of the stope east of the shaft on the first level, but a small streak of rich ore is being followed in the hanging wall, which looks promising for opening. All the stopes on this level, to the west of the shaft, are looking well. A shipment of bullion amounting to $6,082.83 was made on the 25th ult., and another of $7,496.25 on the 28th.

GENERAL JACKSON.—The work at the bottom is progressing as usual. A limited quantity of ore is being extracted, but of very good grade. In extending the drifts good ore will, no doubt, be found.

EAST MOUNT DIABLO.—The north crosscut on the third level is in very favorable ground, and has been driven 15 ft during the week.

CORY DISTRICT.

THEY GO DOWN.—Esmeralda *Herald*, March 25: The doubt existing at one time as to whether the ledges in this district continued down to any depth, has been removed, we are informed, by the recent cutting of the Big Indian ledge in their lower tunnel about 1,000 ft below the croppings. The company's mill is running night and day and turning out bullion. The success of the Big Indian is assured, and before long five more stamps will be added to the mill. The whole district is alive.

GARFIELD DISTRICT.

PROSPECTS BRIGHTER.—Candelaria *True Fissure*: The mining outlook in this district is growing better and the prospects brighter. The Lottie mine, owned by Johl & McDonald, is producing some very rich ore. Three carloads were recently shipped which went up in the thousands, and two carloads, of the same quality of ore, still remain on the dump ready for shipment. The Delaware No. 3 is producing rich ore, a shipment from which will be made in a few days. The Yerrington & Bliss mine is located about one mile south of the Lottie. Tools and provisions have just been hauled to the mine, and active work will be commenced in a few days. Taken altogether the prospects of Garfield district are looking very bright, and before the summer will be far advanced it will be full of miners and prospectors.

GILLIS DISTRICT.

ORE.—Esmeralda *Herald*, March 25: In Gillie district, Clem Ogg is working six men, taking out ore from his mine. Mr. Benton, of Luning, has some men at work in this district.

LAKE DISTRICT.

FLATTERING OUTLOOK.—Eureka *Sentinel*: The outlook of this district is very flattering for the coming summer. Prospectors are scattered from one end of the district to the other, and some of the claims now being worked promise well. The C. & C. railroad are hauling ore to Dayton at a low figure, thus giving the prospector a chance to thoroughly test his property at a small outlay of capital, and at the same time encouraging men to go into the district and look for mines.

LEWIS DISTRICT.

BETTY O'NEAL.—Lewis *Herald*, March 20: The south drift in the Betty O'Neal mine has been driven ahead during the week, the ledge increasing in size, and rich ore being taken out. In the upper stopes the ledge still holds its own. Crosscuts have been run below the stopes and the ledge found carrying the same quality of ore as above, and increasing in size as run further south. The force has been increased, and more miners will be put on in a few days.

STARR-GROVE.—The south drift from the 300-level in the Starr-Grove mine is now in 50 ft, with a crosscut to the hanging wall, with good ore in the top of the drift. The indications are that a chimney of ore is south of the crosscut, as the ledge increases in size as the drift is driven ahead.

CHLORIDE.—The Chloride tunnel has attained a total length of 565 ft. The direction having been slightly changed, will bring it directly under the old workings. The character of the ledge has improved some since last week.

EAGLE.—The contractors on the Eagle tunnel have made good headway for the week past, and are now running under the foot wall, through the country rock. There is about 130 ft of the ledge stripped, and crosscuts will be run to the hanging wall, testing the size and quality of the ledge.

SANTA FE DISTRICT.

AT WORK.—Esmeralda *Herald*, March 25: B. G. Smith & Co. have eight men at work on the Tiptop mine, Santa Fe district, putting the mine in shape to extract ore. The company also have men at work on the Esmeralda mine in the same district. Mr. Anson has arrived from New York, and will commence operations in a short time on the El Dorado company's property, situated in the Gladdin mountains, about five miles from Luning. Of late there have been several parties trying to purchase the Mayflower copper mine from Eli Johnson, the owner, but as yet no sale has been made. Charles Chultz and Eli Johnson are taking out some rich chloride ore from the Illinois claim. They have several tons of high-grade ore now on the dump. The Illinois is the property of Col. A. C. Ellis, of Carson City. As soon as the weather will permit, Santa Fe will have many men at work. T. F. Bradley is now operating at Darlington Springs, Santa Fe district, and has several fine prospects there.

ARIZONA.

TOMBSTONE.—*Epitaph*, April 1: The combination air shaft (incline) since its connection with the stopes, creates the most perfect ventilation, the draft of air being so strong in places that a lighted candle can only with difficulty be carried through the drifts. The incline is now 85 ft deep and being still pushed ahead.

EVENING STAR.—The shaft in this mine is now down 100 ft, at which point a crosscut has been started to the east, and at 14 ft the wall of the lode has not yet been reached. The crosscut is all in good ledge matter. The width of the ore body is thought to be over 20 ft at this point.

OLD GUARD.—Shaft down 105 ft; north drift in 103 ft, and south 65 ft. The vein looks about the same as at last report. The shaft will probably be sunk to a depth of 25 ft before another level is opened up.

INGERSOLL.—Work is progressing as usual, and the output of ore remains just about the same as heretofore. The contract for working 1,000 tons of ore at the Boston mill has been signed, and its reduction will begin on Monday next.

GRAND CENTRAL.—Stopped sinking in main shaft on Wednesday, on account of strong flow of water. Water has risen to where first station stands 18 ft deep in the shaft. Development on the 600 level, old shaft, continue favorable. Shipping usual amount of ore.

VIZINA CON.—No ore will be worked during the next 30 days, for the reason the Boston mill will commence running on Ingersoll ore on Monday next.

HUACHUCA WATER CO.—Up to Friday night, 7½ miles of 7-inch pipe had been laid and 1 mile of 5-inch pipe leading to Carr canyon. There were 100 men working in 2 gangs and they lay about ⅝ of a mile per day. The pipe has nearly all been delivered, therefore there will be no delay in completing the work. Work on the telephone line began to-day and it will be completed in 12 days. Leaving the superintendent's office, there will be a station at the reservoir, back of the Grand Central, and one at the terminus at the dam, in Maple (Miller's) canyon.

CONTENTION CON.—At the Flora Morrison shaft the 600 station has been put in and a drift west run 35 ft through good ground. Connected with the Grand Central on the 500 level, yesterday, which improves the ventilation. The usual amount of ore goes forward to the mill.

ORE.—Globe *Chronicle*, March 25: On a ledge running nearly parallel with the South Pioneer, we are informed, at a depth of 60 ft ore has been struck resembling in appearance and approaching in richness that of the Pioneer. Mr. G. W. Sharp reports the finding of a copper vein 3 ft wide, of good ore, near the Oila river, about 50 miles from Globe. Also promising silver prospects in the same locality, a region not heretofore prospected. "Silver Glance," a correspondent known in Globe by his nom de plume, writes to the *Phoenix Herald* from Pioneer, in which he predicts that the South Pioneer mine will prove equal if not better than the King, and that the camp will become one of the leading mines in the Territory.

CENTENNIAL.—The Centennial mine is taking out 15 to 20 tons of ore a day which assays from $75 to $500. Mr. Geo. Beamish is now in charge of the mine, has had experience, is a practical miner, and says the mine is one of the richest in the district. We may look for developments in this property which will astonish the douhters.

IDAHO.

ATLANTA.—*Idaho World*, March 24: Ed. Ryan, who came over from Atlanta the other day, says the indications are that new life will be infused into that camp the coming summer. None of the mills there are going now, but they will be started up in a short time. The Monarch company intend to put up a roaster at their mill this season. This mill has been idle for a long time. The company have been getting their rock crushed at the Buffalo. The Tahoma is looming up, and gives promise of being one of the best mines of that district. The owners of this mine will erect a mill this season. The machinery was shipped to Kelton last fall, but it being late in the season the roads were in a bad fix, so the mill was not shipped on. The Buffalo company is getting out way up ore. Only a few men have been at work in the mine the past few months, but the force will probably be increased before long.

SNAKE RIVER PLACERS.—*Blackfoot Register*, April 1: Notwithstanding the deep snow and cold weather, a large number of placer claims have already been taken up along Snake river, and the prospect is that before the summer is half gone 100 miles along the river will have been located, and a large part of it being worked. We have been informed that there are at present 6 different companies already organized in the East, who will soon send representatives here to make investments or take up claims, and most of them will at once commence operations. A man bought a claim below here last year for $2,500, and by working it alone took out over $4,000 last season. He was offered $10,000 for it a short time ago, but refused to sell it. The company organized last year, who purchased the claim of Chas. Lane, and have taken up a claim about 7 miles up the river, is called the Blackfoot Gravel M. Co. Several parties are on the ground anxiously waiting for the snow to leave to commence constructing their ditch; the hauk there is said to be nearly 50 ft high and very rich. Other claims have been taken up above that, and still there is room. Mr. Flanuken, one of the purchasers of the Joe Warren claim is expected here in a short time. Mr. Perkine, who is connected with that company, has been here for the past 2 weeks. To Eastern companies contemplating coming this way, we will say one of the advantages of coming to Blackfoot is the Utah & Northern railroad, which will bring them here without any staging. They will find just as good accommodations here, and just as good mining as anywhere on the river.

MONTANA.

BELMONT DISTRICT.—*Inter-Mountain*, March 27: The appearance of the welcome chinook has in a measure infused new life in this district, although it will be a month yet before the snow has disappeared sufficiently for much outside work to be done. In the vicinity of the Whippoorwill mill, two strikes have been made in the past month which will help to keep the 10-stamp mill busy this season. Messrs. Hall and Lahey are taking out gold ore from the Northern Light worth $100 per ton. Lane and Lynch have struck pay ore in a claim they located last fall. The Gloster now has 60 stamps in constant operation. The entire battery of 80 stamps will be running in another month. The ore body in the Gloster holds out well on the 200 level, being as rich and free as near the surface. The Bald Butte mince are being worked continually, by a small force extracting ore. The 1-stamp Sharpneck mill had to shut down several weeks since for want of water, but will soon be running again. The Blue Bird is in fine condition. About 12 miners are employed. The 10 stamps will soon start in motion again. Why this mill ever shut down is a mystery to your correspondent, for it cannot possibly be for want of good paying quartz. The Belmont is now running a full force. Mr. Baldwin, the superintendent, has just finished overhauling and equipping the mine and mill and getting things in the best possible shape for economical working. The Drum Lummon is the same old seven and sixpence. Marysvilliane have given up all hopes of it ever changing owners, until the administrators of Tommy's estate sell the property. Tommy is a pretty tough and hearty old coon now and likely to live many years yet, and they will in all probability have a long time to wait. Placer mining on the creek will soon begin, but most of the placers are owned by the almond-eyed Mongolians; therefore the proceeds do not benefit the "Melican man" much.

NEW MEXICO.

COPPER FLAT.—*New Southwest*, March 25: Considerable work is being done at Copper Flat in the Central City mining district. This camp is about 1½ miles southwest of Woodward's camp. Olvera, Bellm, Barnhizer and Hutchison are all developing their claims. These claims all lie in a basin and are quite rich in copper, and in some cases run some in gold and silver. There are fabulous reports from the Carlisle mine, at Steeple Rock, and Wm. T. Ferrish has undoubtedly added another laurel to his wreath as an expert. The Gila river has been unusually high, and on Tuesday the Clifton coach, and about 20 teams were delayed for a day. The passengers were brought across in Guthrie's private "ceffin," and with the exception of a little leakage everything passed off quietly. Prof. Blake passed through by the Lordeburg coach on his way to examine some mines at Clifton, where he will remain about a week.

TRES HERMANOS.—Meredith & Allman have bonded the Cincinnati mine, in the Tres Hermanos district, for a considerable sum. They have consummated the purchase from D. C. Leroy of the Gen. Hancock and the Toledo mines, an extension of the first. The price for both was $4,000. The bond on the above gives the gentlemen the privilege of doing all the work they please on the mine. They expect to spend $5,000 in finding out the character of the claim. All of the leads consist of carbonate with chloride intermingled. The specimens in the office of Meredith, Allman & Co., which were shown to us, are very rich in horn silver. Two carloads of ore sent to Pueblo, netted Wray, Rascom & Co., the owners of the Cincinnati, at that time, $128 per ton. M. & A. are now timbering the shaft on the Cincinnati, preparatory to working the lead. The crevice of ore body in this mine is about 3 ft wide. These gentlemen will shortly have about 15 men employed on the 2 mines.

OREGON.

GRANT'S PASS.—Jacksonville *Times*, March 31: A Grant's Pass miner writes: Beekman & Klippel will resume operations on the Elizabeth mine in a few weeks. W. A. Johnson has been tunneling all winter and will get out considerable quartz of a promising character this year. Carson & Bybee will commence sinking a shaft on their ledge next month. The long, cold winter has been quite a backset to the miners here, but at the present time we have good weather and plenty of water. Beekman & Johnson's placer mine has been leased for the season to Edward Wade and John Brown. They have sluiced off considerable ground, and are in hopes of making a good clean-up. Wm. Brown is working a gulch claim near the old steam saw mill, with good prospects of fine gold. Fred. Grob, who visited Galle's creek Tuesday, says the miners there have plenty of water and are doing well. The Squaw Lake Co.'s ditch has been cleaned out and put in thorough repair. Piping was commenced a few days ago. The warm weather during the week has been melting the snow in the hills, which is furnishing the miners plenty of water. The Sterling Mining Co. have plenty of water and every pipe is in operation. Supt. Ennis proposes making the gravel fly from now on. Jacob Klippel has received recent advices from T. J. Keaton, now in Idaho, which denote that he is doing well tunneling in Salmon river. Many of the miners will have but a short run this season, on account of the unfavorable winter, but those having ditches or having access to the various streams, will be much more fortunate. Kinney Hammar, of Sterlingville, informs us that the miners of that camp are furnished full heads of water by the melting snow. The same can be said of Foot's creek and other places. W. H. Carter, of Willow Springs, was in town this week looking for hands. His company have several men employed in their mines already, intending to make the best of the opportunity now presented for effective work.

UTAH.

HORN SILVER.—*Southern Utah Times*, April 1: The Horn Silver is not sinking below the 500 level at present on account of not having enough boiler capacity or sufficient cable to sink deeper. We learn that on last Thursday the Frisco Con. Co. had a Government survey made on the Dives mine, with the intention of applying for a U. S. patent. It is the intention of the company to sink down to the deep this summer.

SOUTH HORN.—Work is still in progress on the South Horn under the superintendency of M. L. Cody, and from the thorough overhauling and repairing going on around the mine, he is, we should think, preparing to prosecute work extensively.

LULU.—The drift from the bottom of the 400 ft shaft on the Lulu still continues. A small quantity of water has been struck in this drift which is used for watering horses, etc. A *Times* reporter tasted the water and pronounces it as good, if not better, than the water now used in Frisco.

COMET.—A contract has been let on the Comet tunnel. The face of the tunnel at present shows a good body of ore assaying high in silver and copper. Something of importance will more than likely be shown up in this tunnel, as it is being driven under immense croppings, which it will strike nearly at a right angle.

BINGHAM.—Cor. Salt Lake *Tribune*, April 1st: Bingham, the Old Reliable, is making a good showing and getting out some good ore. The Yosemite is working 20 men, the Jordon 35, the Stewart, No. 1, 30, Osceola, Lucky Boy and the Northern Chief Mining Co. are working a small force. The following mines are leased: Scanlish by A. H. Bemis, working 10 men. He is breaking ground for a 5-stamp mill near the mine. He has a fine body of ore and will make a good clean-up. The Old Telegraph is leased by Hazilgrow & Mullett, who are working 40 men and keep their 5-stamp mill running on good ore. The Winnamuck is leased by 3 different parties, working about 20 men. The Alladin, Neptune, Ashland, Miner's Dream, Victor—Glasgow Mining Co.—are making a good showing. The First West Extension of the Telegraph mine, worked by Lewis Martin, is taking out some fine ore. The Stewart mill, No. 1, is working finely in Carr Fork. The hotel kept by Smith and the Griffin house by A. Klopenstine, are doing a good business.

COAL MINERS' STRIKE.—News from Pittsburg, Pa., dated the 3d, says: The railroad coal operators of the Pittsburg district, according to a resolution passed two weeks ago, reduced the price of mining on Saturday from 4 to 3½ cents per bushel, and to-day 3,000 miners in the Panhandle mines struck against a reduction. A number of the pits are still in operation at 4 cents per bushel, with an understanding that the miners will accept a lower price if the strikers resume at a reduction. The operators claim that they can pay no more than 3½ cents for mining and compete with other districts.

On Minerals.

[Notes of a Lecture delivered before the Mechanics' Institute by A. W. Jackson, Jr., Instructor of Mineralogy, Petrography and Economic Geology, at the University of California.]

(Continued from our issue of March 25th, 1882.)

Cinnabarites.

Tbs chief characteristics of the blendes lie in thsir non-metallic luster and want of opacity. The two sulphides of arsenic (orpiment and realgar) the sulphide of zinc (zincblende); the suh-jarsenide and snlf antimonide of silver (the two ruby silver ores), and the sulphids of mercury (cinnahar), ars the leading members of the family.

Zinchlende, formerly so much drsaded hy silver miners, has quite recsntly become a welcome ore of zinc (through improvement in metallurgical processes).

Ruhy silver I have jnst mentioned as one of ths leading primary silver ores; while cinnabar is too familiar to Californians to need furthsr mention.

Combustibles.

This small class contains the non-mstallic comhustihle suhstances that occur in nature. Aside from the two non-metallic elements, sulphur and carhon, the class is made up entirely of compounds of carhon and hydrogen, or carhon, hydrogen and oxygen. They are compounds that can scarcely be brought under the strict definition of the term "mineral," inasmuch as they are rarely homogeneous, hut rather *mixtures*. There is very little of a general nature to he said of them. I will hriefly mention the leading members of the class.

The familiar suhstance sulphur occnrs very widespread and under a great variety of conditions in nature. It is found in considerahls qnantities in the most recent sedimentary rocks, accompanied hy gypsnm, marl and clay. It is sometimes given off in the form of vapor from volcanoes, condeusing on the crater edges. It is not uncommonly met with on ors veins, and, indeed, is forming in not inconsiderahle quantity at the present time at tbe Sulphur Bank qnicksilver mine in Lake county, Cal. It generally results from the decomposition of sulphydric acid.

Diamond, prized above all other stones sincs 1456, when the art of cutting it first hecame known, as is well known, is the purest form of carbon. It is distingnished in many respects, viz: By its high hardness, hy its hrilliant luster, and by its high index of refraction, which brings about the heautiful play of colors in ths cut stone. It occurs in crystals whicb easily cleave parallel to the faces of the octahedron, hut more commonly still in rounded granules associated often with other gems, like ruhy, sapphire, etc., in placers.

You will find in all the hooks that the rock known as itacolumite, or "flexihle sandstone," is the mother rock of the diamond; that diamonds have heen found in this rock in Brszil.

In spite, however, of the high authority upon which it rests, it would seem as though this statement still needsd confirmation. Prof. Stelzuer, Professor of Geology in the Mining Academy at Freiherg, has told me that, during a stay of ssveral years in South America, he carefully investigated this point; he was not only unahle to find a single specimen of diamond in itacolumite in any of the South American museums, but was also uuahle to find a single persou among those interested that had ever seen such an occurrence. It would seem to furnish a good instancs of the much greater difficulty of eliminating erroneous statements of fact from scientific literature than of making snch statements.

Much more light is certainly being thrown upon the origin of the diamond hy the recent developments in tbe South African diamond fields. It has heeu shown that extensive horizontal beds of hituminous shales havs heen hroken through hy melted rock material from helow. Ths conditions presented, viz.: *Bituminous material* and *heat* from the erupted rock, would seem to be altogether favorable for the formation of the diamond.

The commou form of C., viz., graphite, exists very widely disseminated in rocks of all kinds. It sometimes plays the part of a mica in the crystalline rocks. It is fonnd in largest quantity among the rocks known as the crystalline schists. It occurs in eeveral places in this State, hut alwaye too impnre for use.

The different forms of coal are placed here, although they might with greater justice he considered among the rocks.

Asphaltum and petroleum are the two most important asphaltites or pitches. Both occur in this State, and both are too well known to need further meution.

Amher is the principal fossil form. As is well known, it is the fossilized exudation of a tree, aud is found in the old soil into which it dropped from the tree

Ozocerite is the principal wax. Like most of these hydro-carhons, it is found associated with the softer coals, liguites or hrown coals.

With this mineral we close the rapid review we have taken of the mineral kingdom. We have traveled over a long road in a comparatively ehort time, a road upon which my students spend a whole year instead of an evening. It wae with much hesitation that I attempted to cover eo extensive a field in so short a time. There was danger that I should fail to hold your interest and attentiou on account of the neceesary euperficiality viewed from the standpoint of the individual mineral. Bnt I ehall feel eatisfied if I have eucceeeded in giving you that "Bird's-eye view" of the mineral world, which it was really my object to give.

At my next lecturs I shall attempt to give you some idea of rocks and the rock strncture of the earth, together with a general account of the method of studying rocks. The subject admits of much more satisfactory treatment than the subject of this evening's lecture, inasmuch as the rock types are much fewer in number than the minerals, and they admit of a classification that is to a much greater degree an expression of thsir natural rslations.

Sex in Mineral Veins.

The following curious communication, signed by J. Vau Cleve Phillips, appears in a late issue of the London *Mining Journal:*

In reading Fourier's Philosophy in a nsw hook hy Van Buren Denslow, called "Modern Thinkers," and having read Erasmus Darwin's "Love of the Plants" (Duhlin 1795: grandfather of the present Darwin), I find my idea of sex in mineral veins fortified. My study of ths upper Mississippi lead fisld was from 1844 to 1853, and of the Missouri lead fislds from 1855 to 1880:—1. The lead fields are basins of limestone, these heing from 100 yards to 5 mileswids, and vein system dnplicated in each hasin; 2. All the discovsries of ores in the upper Mississippi and Missouri lsad fisldsmay hs located geograpbically in the hasin where thsy occur, and stratagraphically in the rock and family of veins to which they helong. The lead ores mined in these fields have yielded to date $150,000,000 worth of lead, all of which has heen takeu from the small hasins, or along the edges of the larger ones, aud is from the edge of the vein system, and will not include over 1-20th of 1 per cent. of the ores contained in the basins, as shown in my unpublished geological surveys of the upper and lower Mississippi lead fields. It will he seen from this that the existence of lead and zinc is now known which will supply ths people of the center of the contiusnt with these mstals when it shall have a population of 300 to the squars mile, as England has to-day.

My first attention to ths physical ontline of the crystallization of lead ore was in 1848, while superintending a lead furnacs in Wisconsin. The teams were bringing in ores from 20 different lead discoveries, having north and south veins, east and west veins, and stratified veins from the rock and clay. The east and west veius had regular cubes, the north and sonth veius had the edges of the cubes truncatsd, and the horizontal veius had the solid angles of the tubes cnt off or truncated. Ths ores from ths clay were amorphous, and this form of crystallization was duplicated in each lead hasin. This went to estahlish the fact that ths lead-prodncing and crystallins action had been directly connected with the vein system in all parts of the lead hasin; that the same force which had been exerted to fill the vein system in ons hasin of limestone had dnplicated tbat system in the adjacent hasins, and the physical outlins of the ore was an indsx of its geographical and stratagraphical position in the hasin. Afterwards I was led to the conclusion that the north and south veins were the positive or male veins, and the east and west the negative or female veins. The north and south veins were fsw in number, the east and west veius many, and the north and south veins always pointed towards the hasins of the east and west veins. This law is noticed in the animal and vegetabls kingdoms, in the sheep and goat families, and in the cherry and apple trees, the males being in the minority. In applying this law to iron ores we suppose the magnetic ores are the positivs or male ores, other varisties the negative or female ores. In the silver fields the Comstock, heing a north and soutb vein, would be a positive or male vein, and the east and west veins of New Mexico and old Msxico the negative or female veins.

The great vein known as the San Pietro, in the town of Hidalgo del Parral, is an east and west vein; also the largest and richest mine worked at the old Spanish mining towu of Inde, in the State of Dnrango, Mexico, and known as the Del Aqua (water mine), is an east and west vein. I am not sufficiently acquainted with ths courses of ths veins in the mountain States to apply this law of sex to the vein system of the numerous silver and gold-bearing fields, yet I have identified it in the vein system of the upper and lower lead fields of the basin of the Mississippi, and feel assured that it can he applied to all the families of veins which, as a rule, are aggregated around a central knoh or Boofa, which forms the water-shed of individual families of veins, and which families as aggregated form the great stellar silver helt from Montana south through New and Old Mexico, and that by close observation the explorer and miner may profit hy its application.

The Copper Queen miuing compauy of Arizona has declared its regular monthly dividend of 10 cents per share, or $25,000, payahle at New York on the 1st of April. This company paid au extra dividend of the same amount on the 15th of this month. This is the 11th dividend eince July 1, 1881, when the first was paid. During the past nine months, the ten dividends paid aggregate $250,000. The mine has been a success from the etart, and is represented to he in a hetter coudition to-day than it was niue months ago. It was originally eold to parties in San Francisco, but was suhsequently incorporated under the laws of New York, where the geueral office of the company is located.

The Preservation of Mining Steel Wire Ropes.

Complaints are constantly made as to the rapid wear and tear of stsel wire ropes used for wiuding at mines, and this cannot he said to be owing so much to the quality of the matsrial as to the sudden checking of the movemsnt hy the nse of friction clips when thers is a heavy strain upon the ropes. If checked hy friction, the rope is liahle to heat or tear, or if not allowed to slip at all, to snap off. Now, steel wire ropes are costly things, and should bs mads to last as long as it is possible for them to do, without giving way or breaking, and how this can bs best effected has long been a momentous matter for the consideration of mine owners and mechanical engineers. But no system has been brought forward or adopted until recently by which the full value of a rops can he obtained, and the fraying and breaking of the strands effectually prevented. An invsntion, however, has recently beeu patented in London, and is described in the *Mining Journal*, which promises to be of considsrable value. The invention is patented by Mr. R. B. Jones, of the firm of Garnock, Bihhy & Co., of Liverpool, and James Hughss, an employee of the firm, and relates to improvements to clips, stoppers, or brakes for steel wire and other ropss, being also applicable as winches or for hauling purposes, so that a hrief notics of the iuvention must he of more than ordinary interest to those daily nsing metallic ropes. The invsntion is designed to check the rops whilst working, without any of the severe punishment caused by hard compression or attrition, end without sensihle wearing friction on the rope. For this purpose a brake is fixed, not the rope itself hut on mechanism connected with V-pulleys, rouud which ths rope is twined forming a figure of eight. The friction on the pullsys is so great by reason of ths tnrn round each pulley given to the rope that no appreciahls rslative motion can take place between the pullsys aud the rope. As a hrake, however, is applied on the axles of ths pulleys, or rather on brake wheels on these or on one of tbe axles, whatever friction is expended ou stopping the rope is spent on the brake-block or the belt and brake-wheel and not on the rope. The apparatus is simple and effectual. Upon the overhanging snds of two shafts having hearings in a stout frame fonr pulleys are placed, two on each shaft, which are connected by spur gearing. On the other euds of the shafts are placed two hraks-wbeels with a singls brake-strap, so arranged that a man, by means of a levsr, can put a snfficiently powerful strain ou the brake-strap so as to give the hreks ths requisits power.

Upon one of the shafts is a worm wheel, or first wheel of other train of gearing, and a clutch, so arrangsd that the gearing can be thrown into gear with the shaft at a moment's notics aud hs thrown out again, and ths gearing can be worked either hy hand or power. In operation the rops is passed from a resl through a guiding eye ou to one of the other pulleys; it passes round that, theu ronnd ths othsr outer pulley the opposits way, then round the opposits innsr pulley, the direction heing the same as in the first instance; and, lastly, it goss round tbe remaining pulley in the same direction as round its companion second pulley. The brake can hs applied gradually or suddsnly without any more friction or severe compression on ths rope. By putting the clutch into gear the apparatns becomes a wincb, and, the hrake heing thrown out of action, the rops hauled in. In lowering heavy wsights the hrake can be applied, ths clutch thrown out of gear, and the descent rsgulated with the greatest nicety hy hand pressure on ths brake levsr. Ths apparatus is no more severe on the rope when the hrake is applied than at other times, excepting, of course, the increased tensile strain necessarily entailed when ths lowering of a heavy wsight is chscked, and whilst in othsr winding apparatus thsrs is ths riding of one turn over the other to the great injnry of the rops, in the Jones and Hughes apparatus the drum can be colled to any depth hut no turn rides ou the other under pressurs from the strain of the work performed. The apparatus can also bs used merely as a stopper or hrake, or a winch, as they may be desired; so if the winch he not required the spur wheels and winch need not he added, and it becomes a simple stopper. This simple machinery, so admirably adapted for clipping, stopping, hauliug, or hraking still wire ropes, and can be so easily arranged as to make a complete winch or stopper, should commend itself to mine owners as well calculated to preserve the ropes for winding, and so ohtain from them a much larger amount of work than is now the case.

To Find the Size of Rail Needed for a Locomotive.—Multiply the number of tons (of 2,000 lbs.) on one driving wheel by 10, and the result is the nnmher of pounds per yard of the lightest iron rail practicahle. This rule is only approximate, and is suhject to modification in practice. (Note.—If, as is usually the case with four-wheel-connected locomotives, the weight ou front aud back driving wheels is not the same, the heavier weight must be taken.)

A New Mining Chair.—A fellowship in miniug has been estahlished at Prineeton, which is to he opeu to the seuior clase and to post-graduate students. The income of the fellowship is $600, and the fellow will be required to spend one year in the continuous etudy of the minee aud miuing interests of Colorado. The first award will he made on examiuation next Juue.

Secret Canyon.

Mines in the Baee Range.

The following letter, by John M. Folsy, appears in the Eureka *Sentinel*: Notwithstauding the many ohstacles that have impeded the progress of this slighted and nsglected end of tbe Base range, Secret Canyon mining district is raddidly coming to the front. The great Salishury mill is fast nearing completion. Not knowing anything about machinery, I cannot express an opinion of its msrits or dsmsrits; but this I do know, that Secret canyon contains within itself the elements that guarantees its futurs prosperity. Capital is taking a hold, mines are being incorporatsd, new ones are bsing discoversd, an embryo town is started, many tunnels ere beiug run to tap the mothsr lode, and a general confidence has of lats been inspired. The fact of this mining district being situated so near to the cslehrated and far-famed Eureka district may, in a msasure, account for the incredulity and skspticism so often expressed in regard to the extent and value of its mines. Secret canyon is to-day as if a pound of ore had nsver been extracted from its mines, almost in a virgin state, for the work tbat has been going on bers for tbs ysars psst is surface work—mere scratching. The ores to he fonnd here are dsep.

Now, deep tunnels are hsing run to tap the contact vein. Whsn this is done a graud destiny awaits this district. It will becoms one of the great camps of the State. Nothing can stop it, for the reason that mines and wealtb ars here. The southern end of Prospect mountain extsnds through the district and contains the chisf lode, ores from which have heen extracted that throw Ruby hill and the north end of the mountain in ths shade. A prospector standing ou tbe summit of War Eagls mountain, ths highest in this district, sees the rounded foothills and deeply erodsd canyons which tell him that the landscaps nnder his feet is a patchwork of many rock groups, tbs principal heing sedimentary, through which some of ths oldest eruptive rocks crop out. Geology clearly demonstrates the fact that this part of the earth's surface was for ages covered by the sea. The next geologic event after the birth of those mountains was the pouring out of an immense sea of molten rock, flowing north and south as a sea of firs. Upon the highsr elevations it cooled under the atmosphers and formsd a compact porphyritic rock, while down on tbe lower levels it cooled under water and formed a loose tufaceous rock, now used as the building stone fouud in the quarriss around Eureka, aud extending from there far bsyond this place to the south. A succession of eveuts reaching back throngh geologic time is registsred in the rocks that encass the mother lode of this district—he one born of fire or igneons and the othsr formed of sedimsnt under the sea. Under the atmosphere the world is forsver wasting away. Under the sea it is forever building anew.

The Geddes & Bertrand, for whoss development much money is heing spent in constrncting a great mill and improved machinery, is on this lode, with many other miues equally as great, but too numerous at the preseut time for msntion in this article. The Irish Embassador, the first in richness of the silver deposits of this part of the State, is a fissure vein located on tbs mother lode. The hills here culminate in War Eagle mountain, which is 9,500 ft. ahove tbe sea lsvsl. Ths elsvation of ths range is considsrably lower as it approaches Austin hill. On the soutb side, and ahout 600 ft. in elevation ahove the Bassy canyon, are fouud ths croppings of ths Irish Embassador mine, the general course of which is E. N. E. and W. S. W. The veiu stone projects above the general contour of the hills in a fsw places, hut the greater part of its length is hidden under heavy masses of dolomite and porphyry. Ths slope of the hill varies from 25° to 35°, and ths dip of the lode is nearly 40° to the N. N. W.

Upon entering the mine, on the first level, more than 100 ft. helow the snrface, we find ourselves immediately in ore. The main shaft, inclined, is 4½x6 ft., and 250 ft. in depth, and contains ors from top to hottom. The first level has a track 50 ft. in length, and an upraise 40 ft. toward the surface, from hoth of which a quantity of rich ore was sxtracted. Upon descending the main shaft from tbis lsvel the ore body rests on a smooth foot-wall of silicious limestone and dips all the way to the lowest workings, at an angle of 38°. On the second level a drift rnns west hy southwest 60 ft. in rich ore, much of which worke $800 to the ton. At the end of this drift a winze is eunk 40 ft. in rich ore. From the hottom of tbis winze another drift is run west hy southwest 47 ft. in ore, some of which will assay very high. The third level has a drift runniug east by north-eaet with three ft. of rich ore, every pound of which will assay into the thousands. In this drift, as the work progresses, the ore-body increases in size. From this level another drift is run 40 ft. west by eouthwest, coutaiuing ore of the eame quality as in the east drift. Tbere are other workings too numerous to mention, containing ore of the same character and quality.

This mine reflects credit on its capahle foreman, from the fine manner in which it is opened up. The workings aggregate 600 feet of drifts, winzes and upraises, and must have cost a large sum, as the rock encountered was a very hard silicious limestone. But the mine is ahle to etand it, as ore is found everywhere all through the workings. There is a large amount of very rich ore sacked on the different levels to be taken out when the snow is goue. Foul air hae

retarded the developments. A furnace has been built, and pipes have been run down to the lowest workings for ventilation. In one part of this mine the working forces of matter are playing an important part—that is, chemical, electrical, magnetic and mechanical forces blend in a harmonious manner in forming a mass of crystallized quartz, that will eventually lead to another large body of ore. A deep tunnel is about being driven to tap the mine 500 feet in depth. When this is done the Irish Embassador will be the richest, as well as one of the greatest, ore-producing mines of the State.

U. S. Engineering in California.

The telegraph from Washington announces that Colonel G. H. Mendell's final report upon his project to protect the navigable waters of California against the effects of hydraulic mining has been printed with unusual promptness, and advance copies were received by the House Committee on Commerce, to-day, in accordance with an arrangement made by the chairman (Mr. Page), who intends to bring the subject up for consideration at the earliest possible period, with a view to having an appropriation for this purpose inserted in the annual River and Harbor Appropriation bill. Mr. Page is confident that the committee will act upon the proposition favorably, and that an adequate appropriation for beginning the work will be provided by Congress during the present session. Colonel Mendell's recommendations in regard to California rivers contemplate the construction of a dam on Yuba river, at the narrows, of a height of 75 ft., to cost $204,779; and for repairing brush dams, $80,000. He recommends that $113,500 be expended the first year on the works. He recommends the erection of a dam along Bear river of a hight of 34 ft., to cost $24,600, of which $15,000 should be expended the first year. On the American river he recommends the building of a north fork dam, to cost $24,600, and a middle fork dam, to cost $81,900, of which $22,150 should be expended during the first year. The whole recommendation involves an outlay of $511,600, which is to be expended in 10 years.

Fuel for Smelting.—The cost of wood at Tombstone for milling purposes has risen to $12 per cord with a scant and fast decreasing source of supply—and the mill men of southern Arizona are looking towards the coal deposits of New Mexico for their future supplies. Northern Arizona is exceptionally fortunate in having so great an abundance of timber contiguous to its mining camps, and the price of fuel hereabouts does not in many cases exceed from $3 to $3 50 per cord. It will take a long period of activity in mining to so reduce our resources of wood as to increase the prices much beyond the figures given, and the near proximity of an inexhaustible coal field insures us cheap fuel for all time to come. It is asserted with much confidence by the proprietors of recent English patents that the sulphur in certain classes of ores can be utilized alone for the purpose of smelting the ores with which it is associated, so that even without either wood or coal there is a large and economical fuel supply in many mines in this section if we are to believe the glowing accounts of this process given us by the leading foreign mining journals.—*Prescott Courier.*

Yosemite Valley.—The Yosemite Valley Commission met on Monday afternoon, and decided to purchase the Glacier Point trail, and make it free to the traveling public. A communication has been received stating there is nearly five ft. of snow in the valley, and that the wind has made severe havoc among the trees in one spot, just immediately under Glacier point. Large pines and cedars, from two to four ft. in diameter, have been broken off like pipe-stems; others were uprooted. Large limbs have been wrenched off and hurled into and across the road. Destructive as this wind was, it has opened up one clear spot for the better view of the grand wall of Glacier point, leaving timber and firewood for the valley's use. The mail carrier reports from 12 to 15 ft. of snow on the mountains, so that the falls will be exceeding grand this spring and summer.

Vanadium.—The Prescott (Arizona) *Courier* says: We learn from Mr. C. A. Behm that ore from Ed. Farley's vanadium mine, near Wickenburg, is selling at $4 per pound, and that arrangements are to be speedily made for working it by machinery. We confess to not knowing the utilitarian application of this metal, which is said to be worth, in a pure state, more than $2,500 per pound. Prof. Silliman states that it occurs more plentifully in some Arizona mines than in any other hitherto prospected source. It is found in some of the mines of Silver district, and is described as occurring in crystals of color varying from deep to light orange, somewhat resembling bichromate of potash, and scarcely distinguishable from chromate of lead.

The Michigan Legislature has summarily refused to subject church property to taxation, but the subject is likely to be considered in Ohio. The value of this property in the country is now estimated at over $600,000,000, and nowhere is it taxed.

The preparations for increasing the production of petroleum in the Pico district, Los Angeles, are on an extended scale. New wells are being sunk with great dispatch.

Useful Information.

Wood Acid.

An important industry is growing up in the manufacture of pyroligneous acid, or wood vinegar, distilled from woody fiber. The harder kinds of wood are used for this purpose, such as oak, birch, beech and maple. The distillation takes place in closed retorts, by means of a heat gradually raised to low redness. The country along the line of the Ontario and Western railroad, in Delaware and Sullivan counties, N. Y., is occupied by manufactories of this article, for the vast growth of hard wood in that section of the State is as essential to this business, as a bark supply is to a tannery, or logs to a sawmill. A dozen factories are now in operation in the two counties named, and several more are to be started. For years the secret of manufacture was kept from the public, as those in the business chose to make a monopoly of it, and keep up the prices as long as possible. The products of the factories are alcohol, or naptha, charcoal, and ashes. The acid, when ready for market in barrels, is a dry, dark-colored substance, in small pieces, and looks about like hickory bark if broken into pieces. In an estimate of the weekly business and profits, the books run thus: Cost of wood, $140; six men, $45; lime, $10; cartage, $10; interest and wear and tear, $15. Total, $220. Credit with five barrels of alcohol sold, $260; the weekly sale of charcoal, $40; five tons of acetate, $360; ashes, $12.50. Total, $862.50, showing a net profit weekly of $642.50. Owners are inclined to exaggerate the cost of factories, representing it all the way from $20,000 to $30,000. Five or six thousand dollars is about the figure.

How False Teeth are Made.—A reporter of the Wilmington (Del.) *Star* recently visited a factory where false teeth are made by the million. In the process of manufacture the silex and feldspar in their crude state are submitted to a red heat, and then suddenly thrown into cold water, the effect being to render them more easily pulverized. Having been ground very fine in water, and the water evaporated, the two materials mentioned are dried and sifted. The kaolin is washed free from impurities. These materials, with feldspar, sponge, platina and flux, in proper proportion for the enamel, are mixed with water and worked into masses resembling putty. This done, the unbaked porcelain masses are ready for the molding room. The moulds are in two pieces, and made of brass, one-half of the teeth or sections being on either side. The coloring materials are first placed in the exact position and quantity required, and the body of the tooth and gum is inserted in lumps corresponding to the size of the teeth. The moulds are then closed, and they are dried by a slow heat. When perfectly dry they are taken out and sent to the trimmer's room. The trimmers remove imperfections, and send them in trays of fire-clay to the furnace, where, having remained for 20 minutes, they are complete.

Improvements in Glass Manufacture.—It has long been the aim of those interested in glass manufacture to devise some means by which a perfectly colorless glass could be produced, and it is within bounds to say that very large amounts of money have been expended in experiments having this end in view. While some practical good has been accomplished in improving the quality of the vitreous product, all experiments have thus far fallen short of the desired results. Papers have been recently filed at Washington for a patent for a new process of glass manufacture, the inventor claiming to be able to produce colorless glass, or glass of any color or shade of color desired, and that he can do this with any glass-making plant now in use, no modification of existing melting furnaces being necessary. The product, according to the papers filed, is free from striæ and other imperfections common to glass made by the ordinary process, as well as stronger and better in other respects. If the inventor has actually accomplished what he claims to have done, he certainly has a fortune within his grasp. It is said that experiments are about to be made in Pittsburg to give the invention a practical test.

A New Variety of Glass.—A Vienna chemist has recently discovered what he claims to be a new variety of glass. It does not contain any silica, boric acid, potash, soda, lime, or lead, and is likely to attract the attention of all professional persons on account of its peculiar composition. Externally it is exactly similar to glass, but its luster is higher and it has a greater refraction, of equal hardness, perfectly white, clear, transparent, can be ground and polished, completely insoluble in water, neutral, and it is only attacked by hydrochloric or nitric acid, and is not affected by hydrofluoric acid. It is easily fusible in the flame of a candle, and can be made of any color. Its most important property is that it can be readily fused on to zinc, brass and iron. It can also be used for the glazing of articles of glass and porcelain. As hydrofluoric acid has no effect on the glass it is likely to find employment for many technical purposes.

Luminous paint is now being utilized for door plates, house numbers and signs. The advantages are obvious.

A New Manganese Mineral.—On the McDonnell claim, in Hall valley, Park county, Colorado, 13 miles from Webster, a new mineral has been found, which is described at length in the *American Chemical Journal* by Dr. Malvern W. Iles, of the Grant smelting works, Leadville. A number of analytical determinations show it contains zinc, iron and manganese. The analyses lead to the formula $FeO, SO_3.FeO,SO_3.5Mn,OSO_3.+2HO$; density, 2.1; hardness, 0.75 to 1.; color, milky white; soluble even in cold water.

The Ancient Sawmill.—This is how they used water power to saw wood in England 300 years ago: "The sawmill is driven with an upright wheel, and the water that maketh it go is gathered whole into a narrow trough, which delivereth the same water to the wheels. This wheel hath a piece of timber put to the axle-tree end, like the handle of a broch, and fastened to the end of the saw, which, being turned with the force of water, hoisteth up and down the saw, that it continually eateth in, and the handle of the saw is kept in a rigall of wood from swerving. Also the timber lieth as it were upon a ladder which is brought by little to the saw with another vise."

False Eyelashes.—Labouchere says in *Truth*: "The Parisians have found out how to make false eyelashes. I do not speak of the vulgar and well-known trick of darkening the rim round the eye with all kinds of dirty compositions, or the more artistic plan of doing so to the inside of the lid. No, they actually draw a fine needle, threaded with dark hair, through the skin of the eyelid, forming long loops, and after the process is over—I am told it is a painless one—a splendid dark fringe veils the coquette's eyes."

Dynamite.—It is said that the 15 dynamite manufactories now under the control of M. Noble (the man who introduced nitro-glycerine in its varied forms into public use), turn out about 5,000 tons a year. In this country and in Europe it is estimated that the production of explosives containing nitro-glycerine is between 7,000 and 8,000 tons a year, and this quantity has the energy of at least 45,000 tons of ordinary gunpowder.

Special poisons are secreted by the toad, salamander, newt, frog, etc. M. Paul Bert has collected a liquid from the glands on the neck of the frog which caused the death, with convulsions, of a sparrow to which the substance had been administered.

Good Health.

Keeping Warm.

Dyspeptic persons, those having feeble digestion or a poor appetite, get less internal heat from food combustion, and suffer from cold. Such persons need a warmer atmosphere or warmer dwellings, and warmer clothing to retain the heat that is produced. This applies to all animals.

Close-fitting garments, garters, lacing, boots, shoes, neckties, etc., that prevent free, easy circulation of the blood, each and all diminish the amount of heat produced and its uniform distribution. Exercise promotes more rapid circulation of the blood and increased heat production.

Rubbing wet horses and other animals dry is very useful, not only to save heat, but also to save cold taking. For the same reason any damp garments should be replaced with dry ones as soon as possible, or enough covering be added to prevent chilliness from the evaporation.

Free perspiration (sweating) in hot weather carries off a large amount of heat, and keeps down the temperature. If perspiration be checked, sponging with water aide in cases of sun-stroke or depression from heat. Persons have gone into hot ovens unharmed by encasing themselves in moistened garments, the evaporation keeping down the heat about the body. Green wood, besides its inconvenience, is very unprofitable. A large amount of heat which the dry portions would yield is lost by being carried off in the evaporation of the sap. So of any wet or damp fuel of any kind.

As confined air is a poor conductor of heat, all fabrics that are porous, that is, full of little interstices, tubes or holes filled with air, are the best protectors to keep heat from escaping from the surface of the body. A loosely-worn garment or bed coverlid, is warmer than a compact, firmly woven one, because the air in the texture of the former conducts away heat less rapidly than the solid ones. Loose-fitting garments are warmer than close-fitting ones, for reasons above given, and also because the air-space between them and the skin is a non-conductor of heat.

Stone, brick or wooden walls, with perpendicular air-spaces in them are warmer than solid walls, because the air conducts the heat away less than the solid materials. A sheathing of tarred paper, or pasteboard, or of any thick paper, even, placed midway between the clapboarding and the plastering to form two thin air-chambers instead of one, adds greatly to the warmth of a house or other building. Two half-inch boards set a little apart to leave an air-space between, make a far warmer house-wall than the same thickness of wood in inch boards.

A layer of loose straw put between the wall and the earth banking up of a cellar adds much to the warmth, on account of the air in the meshes of the straw. The same is true in covering roots or apples to be left out in heaps over winter.

Double glass windows are several times warmer than single glass, because of the non-conducting film of air between. So of double doors.

Moving air both carries off heat faster of itself and also increases evaporation, thus largely diminishing the temperature. A very small crack in a window, under or over, or by the side of a door or sash, or elsewhere, produces a draft that requires much extra fuel to counteract the effects.

Sheltering all animals from the cold weather, from chilling winds, which by their motion carry off heat more rapidly, is the way to save food and to save waste of flesh. If by stopping this waste of heat from the surface, all the food consumed will not be wanted to make heat, a portion of it can go to increasing the flesh; that is, to producing growth, or more can be used in making milk, eggs, etc., within the animal.

Vaccination for Splenetic Fever.

Louis Pasteur, the distinguished French chemist and author of "Researches in the Direction of the Germs as the Origin of Disease," is still continuing his work. His latest contribution on "The Germ Theory" is to the *Popular Science Monthly* for April, from which we extract as follows: "The method I have just explained of obtaining the vaccine of splenic fever was no sooner made known than it was very extensively employed to prevent the splenic affection. In France we lose every year by splenic fever animals of the value of 20,000,000 francs. I was asked to give a public demonstration of the results already mentioned. This experiment I may relate in a few words. Fifty sheep were placed at my disposition, of which 25 were vaccinated. A fortnight afterward the 50 sheep were inoculated with the most virulent anthracoid microbe. The 25 vaccinated sheep resisted the infection; the 25 unvaccinated died of splenic fever within 50 hours. Since that time my energies have been taxed to meet the demands of farmers for supplies of this vaccine. In the space of 15 days we have vaccinated, in the departments surrounding Paris, more than 20,000 sheep and a large number of cattle and horses. If I were not pressed for time I should bring to your notice two other kinds of virus attenuated by similar means. These experiments will be communicated bye-and-bye to the public. I can not conclude, gentlemen, without expressing the great pleasure I feel at the thought that it is as a member of an international medical congress, assembled in England, that I make known the most recent results of vaccination upon a disease more terrible, perhaps, for domestic animals than small-pox is for man. I have given to vaccination an extension which science, I hope, will accept as a homage paid to the merit and to the immense services rendered by one of the greatest men of England, Jenner."

Cutting New Teeth at Ninety-five.—Elias de Puy is 95 years of age and still able to walk eight miles a day over rough hills. He lives near Lackawack, in Ulster county, N. Y., in a country sparsely settled, on rough farming lands. He is in excellent health, yet not a follower of temperance principles, for he believed in the old Dutch custom of taking gin "straight," and has chewed all his life the rankest and strongest tobacco. He has had five wives and eight children. His eldest son is 70 and gray-haired, while his youngest son was born after he was 85 years old. He was 60 years of age when he married his last wife, while she was 19. A remarkable thing about Mr. de Puy is that he is cutting a new set of teeth. Nine new teeth have already made their appearance. His eyesight is excellent, and he reads almost continually. He is the most remarkably preserved man in the State.

Remarkable Brain Wound.—A young man named Leonard E. Spencer, of North Fenton, Broome county, N. Y., was wounded in the head October 8, 1881, by the bursting of his gun. His physicians were able to insert a finger its full length into the wound, but were unable to find the fragment of the gun which penetrated the brain. Partial recovery took place. He was at work February 20, when unfavorable symptoms set in, and he died the next day. At the autopsy the cylinder and tube of the gun were found embedded in the brain, near the fore part of the skull. The cylinder and tube were connected in one piece and weighed about three quarters of an ounce. The patient had survived the injury four and a half months.

Sea Bathing Good for the Eyes.—Dr. Amat says that sea bathing "has proved of great benefit in many cases of disease of the eye. The improvement appears to be due to two causes: 1. The influence which such a course has upon the general health, by curing anæmia and elevating the tone of the system, since sea bathing is in the highest degree restorative. 2. Sea water and occasionally, also, the atmosphere of the sea has a local irritant action which should be watched, since it is most serviceable when there is a chronic, torpid and indolent inflammation, while it is exceedingly dangerous when the inflammation is of the acute kind."

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SAN FRANCISCO:

Saturday Morning, April 8, 1882.

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GOOD HEALTH.—Keeping Warm; Vaccination for Splenetic Fever; Cutting New Teeth at Ninety-Five; Remarkable Brain Wound; Sea Bathing Good for the Eyes, 231.

MISCELLANEOUS.—On Minerals; Sex in Mineral Veins; The Preservation of Mining Steel Wire Ropes; Secret Canyon, 280. U. S. Engineering in California, 231.

Business Announcements.

Tonite Powder, Tonite Powder Company, S. F.
Chemical Stoneware, R. C. Remmey, Philadelphia, Pa.
Dividend Notice, Standard Con. Mining Company, S. F.
Ore Concentrators For Sale, No. 73 Nevada Block, S. F.

Passing Events.

The topic of the week has been the very unwelcome veto of the Chinese bill, news of which, though not unexpected, was received with sorrow and indignation by all classes on this coast. All good citizens must deplore the fact that these people will continue to displace white artizans and laborers, to the great detriment and retardation of all home industries and the growth of the State. Progressive industrial classes will not come to us to be brought into competition with the Mongolian.

As will be seen by what is said elsewhere, a meeting of mining men has been held, to devise means of draining the flooded mines of the Gold Hill section of the Comstock. Mr. Patton presented figures showing the amount of water to be pumped out, and estimated the cost of the work at about $500,000. This is a matter of very great interest.

Lead and copper ores are now in great demand, and prospectors will pay more attention to them than has heretofore been the case.

In another column is noted the very generous gift to science of Messrs. Leland Stanford and Chas. Crocker, who presented the Ward collection of fossils, minerals, etc, now in this city, to the California Academy of Sciences.

FOUNDRY AT TOMBSTONE.—James McAllister has bought the Tombstone foundry and machine-shop, and will take possession on Monday. A large part of the iron-working machinery now in the Union foundry, in Virginia City, Nevada, will be removed to this place, thus making this the biggest iron works south of San Francisco.—*Epitaph.*

Oaths by Proxy in Mining Cases.

The Senate has passed the bill introduced by Senator Hill, of Colorado, to allow adverse mining claimants to make necessary affidavits by authorized agents in a local district, or else before the clerk of any Court of Record. The present law, as construed by the Interior Department, requires oaths to be made in person, and in the districts where the claims are situated.

It seems to us that there is now altogether too much opportunity for loose swearing in mining cases without making it practically legal to make oath or affidavit by proxy. It is already understood that one may locate claims without being within a thousand miles of them; and this gives people a chance to appear by an agent in a matter which may, without putting them to any expense, delay and hinder parties who want to patent their claims previous to selling.

A New York man can now locate a claim in Colorado or California, and can appear (by proxy) and prevent others patenting their claims, without leaving home. This is open to several forcible objections.

It was, some years ago, officially decided in a Nevada court, in the case of the 420 Mining Co. against the Bullion Co., that the object of the acts of Congress, in relation to the patenting of mining claims, was not to confer any additional jurisdiction upon the State courts, but to require parties protesting against the issuance of a patent to try the right of possession and have the controversy determined in the State courts, by the same rules, and governed by the same principles, and controlled by the same statutes that apply in other cases.

It was decided by the Honorable Secretary of the Interior, on Nov. 24, 1873, in the case of the Jenny Lind against the Eureka, that an adverse claim, to be considered, must be sworn to by the party claiming adversely, and *not* by an attorney. This ruling has been enforced by the Commissioner of the General Land Office.

The Secretary of the Interior, in an appeal case, in 1874, would not recognize an adverse claim because it was not sworn to before an officer authorized to administer oaths in the land district in which the claim was located. It was decided, also, by the Secretary of the Interior, in 1873, that a commissioner of deeds for Nevada, residing in California, was not an officer before whom an adverse claimant to a mine in Nevada might make oath to his claim.

It has been decided long since, and the ruling maintained by the Commissioner of the General Land Office, that an adverse claim cannot be filed by a party having no interest.

All these rulings are now overturned by the new procedure, simply, it appears to us, for the convenience of a lot of "stay-at-homes," who will act as blocks to the progress of every mining camp.

It is provided in Sec. 2326 of the U. S. revised statutes, that the adverse claim shall be filed during the period of publication of notice; that it must be on the oath of the adverse claimant, and that it must show the nature, the boundaries and extent of the adverse claim.

To carry this section of the law into effect, the Land Office instructs that the adverse notice must be duly sworn to by the person or persons making the same, before an officer authorized to administer oaths within the land district, or before the registrar or receiver; it will fully set forth the nature and extent of the interference or contest; whether the adverse party claims as a purchaser for valuable consideration, or as a locator; if the former, a certified copy of the original location, the original conveyance, a duly certified copy thereof, or an abstract of title from the office of the proper recorder should be furnished; or, if the transaction was a mere verbal one, he will narrate the circumstances attending the purchase—the date, the amount paid—the facts to be supported by witnesses, if any; and if he claims as a locator, a certified copy of the location notice must be filed. He must file a plat showing his entire claim and its relative position to the one against which he claims, and the extent of the conflict. This plat must be certified, and show shafts, tunnels, etc.

Under this new law, all this can be done by any person paid to represent the adverse claimant, the latter individual remaining quietly at home. This is all very well for the rich man, but will work hardship on the poor one.

It is of course possible, under these circumstances, for unscrupulous men to actually "freeze out" legitimate owners, by getting equally unscrupulous men to file adverse claims. The original owners, by delay, hindrance and expense, will compromise or do anything to get rid of the burden. True, the Secretary of the Interior has disregarded an adverse claim, because supported only by affidavit, but in the very decision which establishes this rule, he officially admits that the mere affidavit, unsupported by other proof, *delayed* the case for the period of over a year.

A man is compelled by law to advertise for a certain period that he is going to apply for a patent for his claim. This gives people a chance to file adverse claims, as it is intended to do; but it also gives people a chance to annoy claimants, and, in some cases, levy blackmail, or what is equivalent to it.

It was officially decided by the Land Office, in 1874, in the case of the Shoo-Fly, Magnolia and others against Mono, that any state of facts which shows that the person alleging the same has a better right to the premises sought to be patented, or any portion thereof, than the applicant for patent, is the proper subject-matter of an adverse claim, and when properly set forth, should be treated as such. Under this ruling and subsequent ones, it is possible for people not legitimate adverse claimants to annoy the applicants for patent exceedingly.

New Hurdy-Gurdy Water-Wheel.

In no place in the world are "hurdy-gurdy" water-wheels, as they are called, so commonly in use as on this coast. Since the early miners first began to use this form of wheel it has been much improved. In wheels of this character, revolving in a vertical plane upon a horizontal axis, the nozzle from which the water is forced is usually placed at the lowest position of the wheel, so that its stream may be directed upon or into the buckets descending as they successively come within the line of its discharge. These buckets upon the rim are generally placed so close together and the nozzle in such near proximity that a prime object is to construct them so that they will free themselves of the water the moment its force is expended, in order that they may not interfere with each other and retard the wheel.

In the first forms of these wheels, perfectly flat pieces were used, against which to direct the stream. These, while they were of a shape to receive the force of the stream to the best advantage, could not easily free themselves, and the water having no proper reaction, remained to hinder the succeeding buckets, and the progress of the whole wheel. An attempt was made to improve upon this by inclining the edges or sides of the buckets, the bottom still remaining straight and flat, and though this effected good results, it still failed to free the buckets. Subsequently, a scoop-shaped bucket was introduced, the inner face of which was bounded entirely by curved lines. This bucket freed itself by the reaction of the water much better than the others.

Daniel Donnelly, of Sutter Creek, California, has just patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an improvement in this class of wheels. He thinks, in relation to the scoop-shaped buckets, thus far considered the best, that the force of the water is impaired by striking upon or within a complete concavity; and whatever advantage the first forms of buckets possessed by reason of opposing a flat surface to the stream was thus destroyed. Another objection he makes to all the forms of buckets used in this connection is, that their backs are so formed as to carry up water with them, thus, in a measure, retarding the motion.

In the improved buckets devised by Mr. Donnelly, and which form the subject of his patent, each has at its rear end a shank, set a little off the center, and they are fitted to the rim of the wheel by having their backs impinge on its periphery and their shanks pass beside it, and bolted or riveted thereto securely.

The shape of the face or inner surface of the bucket may be thus described: In the direction of its length—that is, from top to bottom—it is hollowed out, its walls sloping in curved lines to the center. In the direction of its width—that is, from side to side—it is hollowed out down to a certain distance upon each side of a central line drawn through its length, and is then left flat. The flat portion extends the length of the bucket, and may be in width about one-third of the whole, or sufficient only to receive upon itself the stream of water. The bucket being hollowed out in this manner, the edges are curved down, those upon the sides in a true curve, while those upon the ends are curved down to a straight line.

The stream strikes the face of the bucket below the center upon the flattened portion, which presents a better surface for the impact, the inventor thinks, than if it were concave on all sides. After striking it follows easily the contour of the curved sides, rather than the flat portion, and is discharged from side to side, rather than over its top and bottom. Thus the inventor obtains the advantage of a flat or straight surface against which to direct the water and at the same time he has the curved sides, which free the buckets in the reaction.

In order to be impeded as little as possible by the spray and waste water, the outer or back surface of the bucket is constructed in lines that are all curved or sharpened to an inclined line in the center of the back, in a manner similar to the prow of a ship. This adapts it to clear itself of water readily, very little being carried up with it, and the inventor is confident that this is a very decided point of advantage when the wheel is revolved at a high rate of speed.

CABABI DISTRICT.—The Arizona *Citizen* says: Mr. David Armstrong left the city this morning for the Oro Plata mines, Cababi district. These mines have recently been incorporated. Mr. Armstrong as superintendent will commence active work on the property at once and goes for the purpose of letting contracts on the different claims. Considerable work has been done on the Copperopolis mine, and from the showing of a shaft which is now down over 50 ft. has the promise of something unusually rich for its lucky owners.

Sanitary Science.

An Inquiry Into the Cause of the Abnormal Death Rate in San Francisco.

EDITORS PRESS:—The recent inquiry into the causes of the abnormal death rate, has brought to public notice the execrable blunders of the engineer and builders and the present horrible condition of our sewers, and it is to be hoped that it may lead to beneficial results.

While it is admitted by all that the sewers are very defective in construction, and in certain places entirely inoperative, and while there is no question as to the insanitary character of sewer-gas, nor as to its deleterious effects, particularly when it gains access to our houses, there is room for doubting and antagonizing the theory so persistently urged by certain experts and supervisors, as reported in some of the public journals, that "there is no other way of accounting for the recent weekly deaths ranging from 125 to 135."

Without calling in question the motives of these alarmists, let us look closely at this subject in the light of sanitary science and our own experience, and we shall probably discover that "the extraordinary mortality this winter" should *not* all be laid on the bad sewers.

The measures recommended by Dr. Meares—to wit: fumigation, flushing and cleansing—are, after all, only palliative, performing only a brief service; and when we consider the vast quantity of debris daily deposited into the sewers, the insignificance of the work of removing a few tons, consisting principally of sand, by manual labor, through the manholes, becomes apparent, for the small excavations so made are speedily filled up by the flowing mass.

Flushing will carry away the bulk of the accumulation, and should be practiced frequently, if only for æsthetic reasons; but this and all other cleaning methods will fail to keep the sewers free from putrescible matter. The conditions being favorable in a sewer, the process of fermentation commences quickly and continues actively

Producing Immense Quantities of Gas,

Which has the power, according to Prof. Doremas, of penetrating brick or stone walls, or any other porous material, and these bacteria possess an extraordinary power of multiplication. Thus, F. Cohn, a high authority on these matters, has calculated that "one single bacterium might, in less than five days, fill up, by its progeny, the whole ocean, supposing they found a sufficiency of food." There is never any scarcity of bacterial food in sewers. Reference is made to these things, not to discourage efforts at cleansing our sewers by fumigation and flushing, but to show the utter futility of such methods in securing any substantial or permanently beneficial results.

There should be no delay in repairing bursted and caved sewers, and their mouths should be kept open so that the corrupt sewage may have free and unobstructed egress to the bay. And of equal importance is thorough ventilation. Dr. Meares has stated the well-known fact, that sewer-gas is many times lighter than air, and ascends along and accumulates at the most elevated points ("Nob hill," for instance), where the pressure is the greatest, provided there are no vents at intermediate points. These facts being admitted, it is evident that, by placing

Ventilating Tubes at the Highest Points,

The dreaded gas could escape into cosmic space above the roofs of the houses, thus relieving the pressure in the sewers.

The accumulation (mainly sand) in the depressions, caused from settling or imperfect alignment of the sewers, might then be tolerated with comparative impunity, until the city shall be better able to bear the heavy expense of the new sewers proposed by Mr. Molineux, and I will venture to suggest that the Supervisors can render no greater service, after or aside from repairing, flushing and ventilating the sewers, as above proposed, the cost of which need not be great, than by following the example of the New York and Brooklyn authorities in relation to the house connections, which are notoriously bad in this city. Dr. Simpson tells us that three quarters of the dwelling-houses in the city are not protected by their

Plumbing Work

Against even gas. Now, in this lies the solution of the sewer-gas problem, and it is to be hoped that our authorities will move at once upon the works of the plumbers by adopting and enforcing the regulations of New York, printed copies of which can be obtained on application to the Board of Health of that progressive city, and by so doing they will give us the best possible protection against sewer-gas, and the expense would fall upon the house owners, where it properly belongs. This is a duty they owe to society, for public sanitation can only be made effective by applying to all a uniform rule of private hygiene. The law declares in unfaltering and equitable accents: "The people must make use of their own property in such a manner as not to injure that of others." The temptation exists to say more upon this subject, but I must forbear, and will submit some thoughts and facts which have led me to think that the exceptional weather this winter, which has no recorded parallel, has more to do with the high death rate than sewer gas. It is getting to be quite common, where communities are afflicted, as we have been this winter, to attribute every disease to sewer-gas, from corns on our

toes to "pinkeye of the horses," and people become crazed by the doleful predictions and queer and misleading remedial propositions of Supervisors, civil engineers and others.

Now, according to Dr. Simpson, the

Only Disease Prevailing Here.

As an epidemic, is measles, which is a disease common to all countries and it has no respect for persons, or places, breaking out in the palaces of the rich and the hovels of the poorest, and with no less frequency and virulence in the olean end isolated country residence, innocent of sewer gas, than in the crowded city. It is doubtless caused by some aerial infection, but with our present limited knowledge of the origin and nature of the microscopic denizens, and varying electrical conditions of the atmosphere, the wisest will hesitate to say that it is caused by sewer-gas. The air we breathe is rife with

Bacterial Life,

And so is, also, the water we drink; there is abundant testimony that the germs which produce the zymotic or "filth diseases," are quite as often introduced into our systems by water as by air, and since Spring Valley water is notoriously foul, it is quite as reasonable to ascribe the increased mortality to the impure water as to the sewer-gas, especially if we accept the declarations of Pasteur and Miquel, the highest authorities on these matters, that "the number of atmospheric bacterias is very small in winter and that they do not again increase until the ground becomes warm and dry, in the spring and summer." The announcement is even made by these scientists that "the vapor of water, arising from sewers, or from masses which are in a full state of putrifaction is always microgaphically pure, that a gas which comes from buried matters which are decomposing is always free from bacterias, or microbes, provided the air is in a certain state of *humidity*." If the theory, now generally accepted, that the atmospheric organisms, the miasmetic agents of fermentation, and the causes of zymotic diseases, are dormant and harmless during cold and damp weather, and which theory corresponds with our experience and observation in reference to yellow fever and kindred diseases, which are greatly mitigated and quickly disappear with the advent of frosty weather, is correct, it goes far to disprove the assertion that the present abnormal death-rate is due to sewer-gas, seeing that the atmosphere is cold and humid, and we should look in other directions for the cause of the trouble. There is good ground for suspecting the water, which is turbid with putrescible matter and more attention should be given to its

Purification by Means of Filtration.

It is known that contact with iron, as when stored in iron tanks, affects a speedy and perfect purification of water, the organisms being oxydized—burned—by contact with the iron and oxygen in the water, in which condition they are entirely harmless. Preference should, therefore, be given to the domestic filters in which the filtering-bed contains some preparation of oxide of iron. The small contrivances, in common use, which are attatched to the house-tape, are mere *strainers*, catching only the slimes and coarser contaminations, while the dangerous organisms and their germs, being microscopic, pass through each filters as freely as the water.

While I believe in the germ theory and am convinced that the cause of sickness and death is as often traceable to polluted water as to sewer gas, especially in this city, where the drinking water (Spring Valley) is turbid with impurities, and where the thermometrical and hygrometrical conditions of the atmosphere are unfavorable for active bacterial work, I think that the real cause of the present high death-rate is justly attributable to

The Exceptional Weather,

Which has no recorded parallel, and more particularly to the prevailing north wind. The electrical condition of this wind has not yet been ascertained, but we can all testify that it has a great thirst for moisture, to which quality we may safely ascribe its pernicious influence upon animal and vegetable life. Wind—air in motion—blowing from any direction, has great evaporative power, and the drier the wind the greater will be the evaporation. All know that evaporation is cold. The more rapid the evaporation the greater will be the cold produced. The effect of rapid evaporation of the moisture of the human skin is what we call a cold. The heat required to perform the *work* of evaporation is abstracted from the body, the pores of the skin close and cease to perform their functions as excretory organs, and the effete matters which should have been thrown off through these pores, clog the system, acting as a poison and producing inflammation and distress. It will settle upon the weakest part of the body, generally upon the respiratory organs. A slight cold may, and often does, under favoring circumstances, develop zymotic power that, like snake poison, ferments in the body till death is inevitable. The mortuary report for the last month—February—shows that fully one-half of the deaths resulted from diseases of the lungs and air passages, and half of these were children under ten years. Pneumonia is the prevalent complaint, and about 20% of the deaths in February are charged to that disease alone. It may be said that nearly all of these diseases of the lungs and air passages were caused by and commenced with a cold, and none of them are classed as zymotic, though some of the cases may have developed symptoms of that character. There were sixteen deaths from typhoid fever, which is certainly a "filth disease," but instead of being caused exclusively by sewer-gas, or aerial infection, the virus of this disease exists in, and is generally taken into our systems by the water we drink or the food we eat.

Three Parasitic Infectious Agencies

May and often do pass harmlessly through the body, but when they find a favorable nidus they multiply and produce a specific disease, such as cholera, or typhoid. Even diphtheria, which carried away 13 children last month, is not strictly a zymotic or "filth disease," but usually begins with a cold. Upon this point the report of Drs. Wood and Formad, recently published by the National Board of Health, is a very interesting paper. These medical gentleman conclude, after a long and thorough investigation, that "there is no difference between the micrococci of furred tongue, or ordinary sore throat and those of diptheria; the two are the same organism existing under different conditions. A common catarrh or simple inflammation of the mouth or throat, caused by a cold, in a weakly subject, as in a child, which has little resisting power may, under favorable conditions, end as adynamic diptheria with blood poisoning. The micrococcus which, directly or indirectly, causes the diptheria, is not a specific organism different from that common to healthy and inflamed throats, but is an active state of that organism which increases the inflammation and thus engendering an epidemic of diptheria, and there is clinically every reason to believe that the blood poison has been developed within the body of the patient." The special conditions favoring the changing of inactive into active micrococci remain yet to be studied, but that they are filth, or moisture, or temperature, or a combination of these, is questionable, for the simple reason that there are now, and have been from time immemorial, places that are over-crowded, filthy in every possible way—damp, hot and cold—in short every variety of combination of these and yet, where there is not and has not been any diptheria. This reasoning may safely be applied to many other diseases commonly called zymotic and supposed to be caused by sewer or other infectious gas or fluids, but which are really caused by cold, and I will venture to say that nine-tenths of the diseases that afflict mankind are due, primarily, to cold (excepting, of course, accidents and hereditary diseases), and my experience and observation have convinced me that they are preventable, in most cases. The prophylactic with which this may be accomplished is not new; it is simple, more agreeable and cheaper than medicine, and accessible to all. It consists in the conservation of the heat of the body by proper and sufficient clothing. Science, ancient and modern, teaches us the great truth, that energy of mind and strength of body are the effects of warmth, while depression of spirits and bodily weakness result from cold. Heat is vigor and life, and cold is disease and death. This is a wide subject and embraces other questions, but I shall confine myself to the important one, namely, "clothing."

We all know how easy it is

To Catch a Cold.

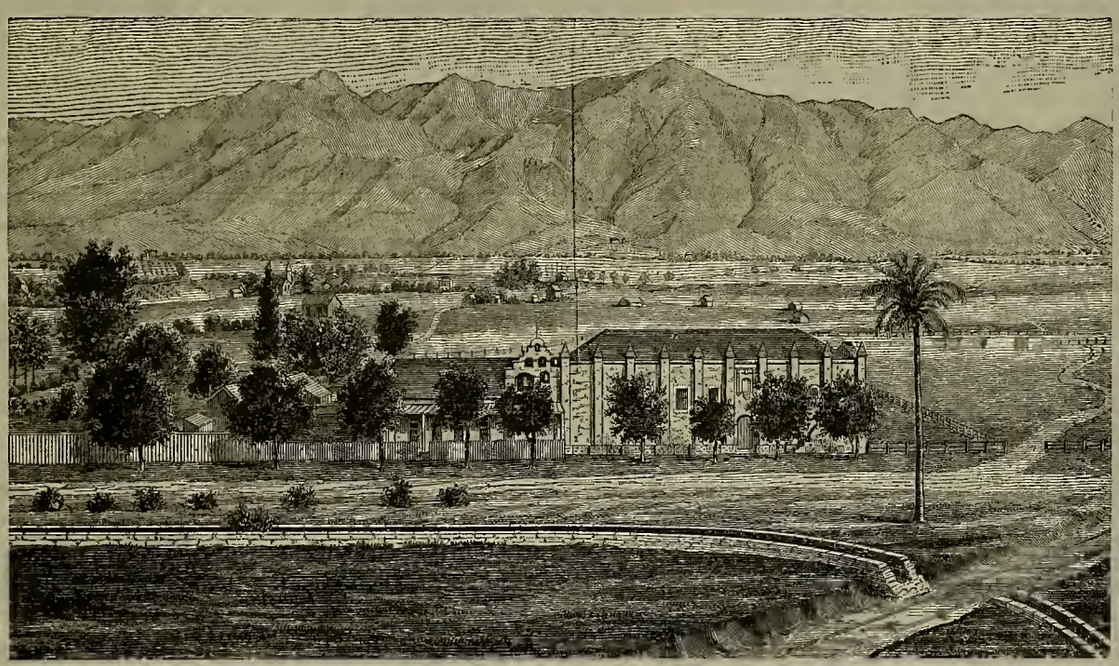
When the circulation is accelerated, and the blood thrown upon the surface, opening the pores of the skin and producing perspiration, we need only to expose ourselves to a draft to bring on a chill and sneezing, followed too often by most serious consequences. The chill is the result of the rapid evaporation of the moisture, by which process a great deal of heat is abstracted from the body. Weakly persons and children are most susceptible, and our north wind is particularly severe upon such persons when exposed to its refrigerative power under the conditions above named. The same agency, also, abstracts heat, though in less degree, by radiation, even when the body is in its normal condition. Comparative protection against these great evils may, however, be secured by insulating the body with good non-conducting clothing, which retains the heat and prevents *rapid* evaporation. If the over-heated body is allowed to cool off *slowly*, the danger is greatly mitigated, if not wholly averted. It is not the heaviest or thickest material which is the warmest. Wool is an excellent non-conductor, and is 300° better than cotton, and still better than linen. One thickness of wool is the equivalent of four thicknesses of cotton or linen in point of conductivity, and is also far more porous than the fibre plant. The latter absorbs the moisture and sticks to the body, leaving no air between and forming only one smooth evaporative surface, from which the moisture quickly evaporates, producing cold, whereas a wool or hair cover, being never entirely soaked, does not cling closely to the body, but forms a surface which is broken by air bubbles, permitting the moisture to percolate to and evaporate *slowly* on the outside, thus conserving the heat, while the skin remains in a blood rich state, and may perspire more freely than when exposed to a quick refrigeration, by evaporation and radiation from cotton or linen clothing. The

Importance of these Facts

Cannot be over-estimated, and people who wish further light and testimony, are urgently referred to the works of Dr. Pettenkofer, Prof. of Hygiene at the University of Munich, and Dr. Jaeger of Stuttgart, who have chosen, with highly satisfactory results, and earnestly recommend, for the conservation of the heat of the body, "only the material which nature has given for the same purpose to those mammals which are the most nearly related to man, namely, animal wool, even avoiding pocket and other linings of cotton."

In conclusion, I beg to say that I have tested the value of woolen clothing upon my own person and the members of my family with the most happy results. Several years ago our under-clothing consisted mainly of fiber plant; and we frequently contracted colds, resulting in obstinate chronic catarrhal and bronchial difficulties beyond the reach of approved pharmaceutical measures. We adopted the "normal clothing"—some members wearing double woolen-flannel under-garments—and since then have not only not taken any fresh colds, but the chronic difficulties referred to have disappeared, and this explains my enthusiasm over woolen clothing, and excites my sympathy for the little children who suffer most from improper and insufficient clothing, my observation being that a large majority wear no woolen clothing at all, and only a very few, especially girls, wear woollen under-clothing below the hips; below, the short, loose skirts are only a shield against the wind, while below the knee the only covering is a thin cotton stocking. In the light of these facts people, especially women, should strive to overcome the inertia of established habits and public opinion, and adopt the normal clothing of Pettenkofer and Jaeger, which will certainly increase the longevity of the community and enhance its comfort and enjoyment.

LAYMAN.



SAN GABRIEL MISSION, THE VALLEY AND THE SIERRA MADRE MOUNTAINS.

San Gabriel Mission.

We give a handsome engraving of San Gabriel Mission, one of the land-marks of the southern country. It is one of the best preserved of the old missions, and is well worth a visit from all who come into its vicinity:

Between San Diego, where the cross was first erected, and Monterey, their objective seat of empire, the fathers found no country so fertile and inviting as the San Gabriel valley. The forests were filled with game, wild foods of every kind were plentiful. The increase of live stock introduced by them was beyond all precedent. The olive and the vine flourished. Remains of the Vina Madre or Mother vineyard of San Gabriel may still be seen. With an eye to beauty as well as utility, these vineyards were intersected with walks shaded by fruit trees of every description, adorned with roses and flowering shrubs, and made pleasant by the sound of flowing waters brought from the surrounding hills. When the Mission Viego was abandoned for the more eligible site of which the church at San Gabriel is a monument, Father Salvadea reigned in supreme authority over some 15,000 souls. He believed in education by work, and his converts were no sooner baptised than they in turn were set to convert chaparral into pastures for the Lord's flocks; he built the mill and dam at the Kewen place, enclosed many miles of the domain with hedges of tuna, laid out a beautiful square around the church with a sun-dial in the center, planted the first orange orchard, and brought the date palm, it is said, from the city of Mexico, to whisper at vesper time of the triumphs of the redeemed. How dream-like and unreal all this seems as the train goes whirling past the lonely palm tree and the old sanctuary, and is lost in the distance.

The old ground of the *padres* it now the site of some of the most famous orchards and vineyards of the State.

Death of Owen O'Neil.

We announce with deep grief the sudden death of Owen O'Neil, who was for several years proof-reader for Dewey & Co's publications, and for two years has edited the *Pacific States Watchman*. Mr. O'Neil's death was strangely sudden. He was in his usual good health on Monday morning. After taking a warm salt-water bath at North Beach, he went under the cold shower and was suddenly struck down. He retained consciousness only long enough to tell his residence, where he was immediately conveyed. He remained unconscious for several hours and then died quietly. Deceased was well known among the fraternal societies, and was a member of Olympic Lodge, A. O. U. W., and Bohemian Council of the American Legion of Honor. Among his fellow workers Mr. O'Neil was universally liked and respected as an energetic, even-tempered and industrious young man. He was most earnestly devoted to his work, and had a bright future as an honest and conscientious journalistic worker. His loss will be deeply felt in this office.

Mr. O'Neil's funeral was held under the auspices of the societies of which he was a member, on Wednesday afternoon, and was attended by the employes of Dewey & Co. Floral offerings were numerous and beautiful. Mr. O'Neil leaves a wife and two bright little boys which were the delight of their father's heart. His memory will be long cherished.

A SPECIAL from Benson says: The New Mexico and Arizona Railroad was opened for freight and passengers this morning. The fare from Benson to Contention was $1 50; general merchandise, 11 cents per 100 pounds. The trains connect with all Southern Pacific trains at Contention, and stages connect for Tombstone, which is nine miles from Contention.

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HOISTING ENGINES Large or Small for flat or round rope. Double Cylinder Engines, from 6x10 to 18x60. This latter size furnished J. B. Haggin for Giant and Old Abe Cn, Black Hills also Corliss Pumping Engines, 26x60, for Hoisting and Pumping Works, for 2,000 feet deep. **Baby Hoists for Prospecting, 4 H. P. to 6 H. P.**

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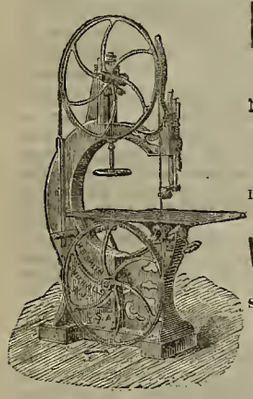

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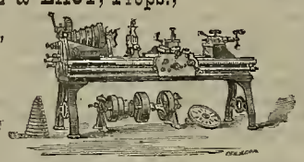

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INGERSOLL ROCK DRILLS.

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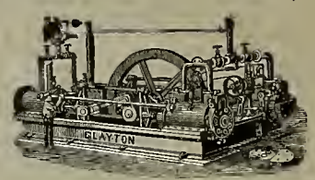

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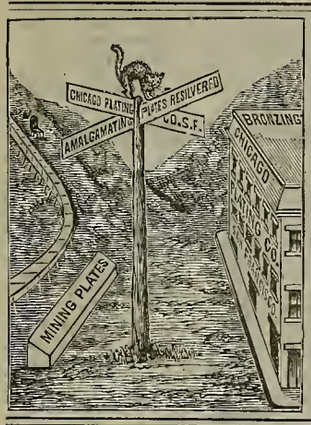

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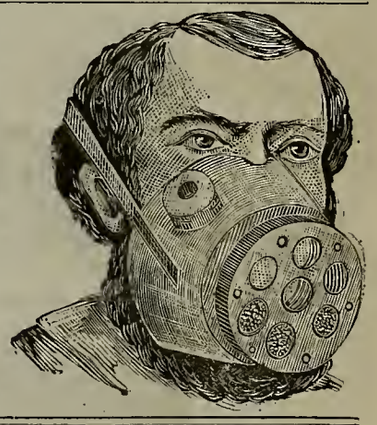

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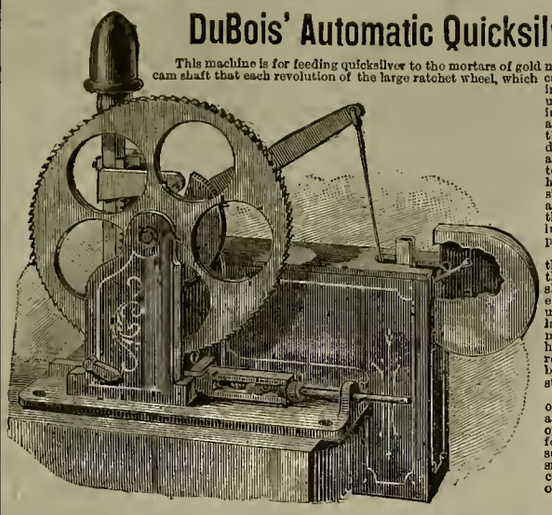

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.
The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.
A chief point of excellence of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; *i. e.*, from every one to four minutes.
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It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt. Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.
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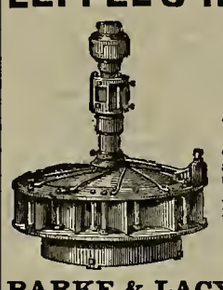

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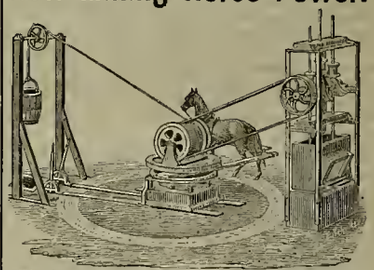

The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING MARCH 21, 1882.

255,135—DESOLPHORIZING FURNACE—A Blatchly, S. F.
255,259—WATER WHEEL—Daniel Donnelly, Sutter Creek, Cal.
256,299—CANE, UMBRELLA HANDLE, ETC.—Thos. V. Keam, Keam's Canyon, A. T.
255,301—SHOE—David Lubin, Sacramento, Cal.
255,191—CLEARING SLOTS OF WIRE ROPS, R. R.—John Powers, S. F.
255,335—HOSE COUPLING—E. A. Rix, S. F.
255,372—CONDENSER FOR STEAM ENGINES—R. E. Williams, Grass Valley, Cal.
256,334—SIDE SADDLE—L. A. Reister, Chico, Cal.

FOR THE WEEK ENDING MARCH 28, 1882.

255,481—GATE—Charles H. Allison, Elmira, Cal.
255,584—FIRE ESCAPE LADDER—R. F. Bridewell, S. F.
255,601—CAR-COUPLING—L. J. Cralle, Santa Rosa, Cal.
255,602—FAUIT DRIER—Charles A. Curran, Albany, Oregon.
255,509—STEAM GENERATOR—Wm. D. Horker, Oakland, Cal.
256,642—BOTTLE AND BOTTLE ATTACHMENT—D. Lubin, Sacramento.
255,533—PICK—Eben R. Ray, Bodie, Cal.
255,623—PIPE-COUPLING—S. Lighthurne, Jr., S. F.
255,678—PULVERIZING MILL—Wm. C. Salmon, Portland, Oregon.
255,736—VEHICLE BOLSTER—Dyas Shelton, Santa Rosa, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

FARM GATE.—Charles H. Allison, Elmira, Solano county, Cal. No. 255,481. Dated March 28th, 1882. This is a gate made longer than the width of the gate, opening and having one of its hare supported upon rollere or pulleys, so that the gate may he moved backward and forward aoross the gate, opening and halanced upon the rollers. In combination with this sliding-gate is a wheel, mounted npon the posts of the gate, opening and having ropes or cords wound upon it from opposite sides and leading down heneath pnlleys, and thence to the ende of ths gate, so that when the wheel is turned by one of the cranke which project to each side, the ropes will operate to move the gate upon its rollers, and thus open or close it.. In some cases the ropss may pass directly from the wheel to the tops of the gate-posts, which may extend upward.

PIPE COUPLING.—Stafford Ligbthurne, Jr., assignor of one-half to J. R. Mackenzie, S. F. No. 255,523. Dated March 28th. This improvement in pipe coupling consists in a novel formation of locking-lugs and slots on the meeting ends of the coupling hy which the two parts may he firmly united, and in combination with these, the inventor employs a peculiarly constructed elastic ring, hy which he is enahled to make a perfectly tight joint. The present invention is an improvement on a coupling patented hy the eame inventor in 1877. A cap is employed to protect the end of any coupling when separated, and an implement hy which the locking device may he unclasped or released is also used.

MINING PICK.—E. R. Ray, Bodie. No. 255,533. Dated March 28, 1882. This invention is in that class of picks in which the points are adapted to he easily fitted to and removed from the stock. It coneiets in a novel construction of the stock and points, with corresponding shoulders, and sockets wherehy the latter may he readily and securely fitted to the former.

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PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

Production of the Precious Metals.—No. 3.

An Abstract of the Ceneué Monograph on the Bullion Output of the Country.

Placer mines, with the exception of pocket mines. and branch mines, require no reduciog process; and in the two exceptions named the mill process is not always a necessary concomitant; in the former, in fact, hnt rarely. Various systems of reduction hy chlorination and amalgamation have also heen applied to black sand deposits and refractory conglomerates containing placer gold, hut not to an extent affecting the general principle of classification here maintained.*

Statistics of the Pacific Divieion.

CALIFORNIA.

In production of gold California still bolds the first place. The amount of silver contributed hy California is relatively small, and comes mainly from two adjoining counties, Inyo and Mono. 57 amalgamating mills, concentration and leaching works, 9 arastras, and four smelting works in this State. These include most of the more important establishments, and are supplemented hy general reports covering, in some cases, whole districts. But, with all the care taken hy tbe census experts to thoronghly cover the ground, the snbject was hy no means exhausted, and in several cases in the accompanying tahulation resort has heen had to information from outside sonrces.

California furnishes 71.47% of the total placer product of the United States, and 40.09% of the total gold product of the deep mines, or 51.38% of the total gold product of the country (from all sourcss). The yield in silver, however, is only 2.80% of the total, California standing sixth in rank as a producer of the latter metal. In proportion to its area, again, California leads in production of gold, with an average of $108.30 per square mile; is sixth in its silver yield of $6.84 per sqnare mile; and third as to its output of hoth metals, $115.14 per square mile. As the population of the State hae largely increased, while the mine production has remained nearly at a standstill for some years, the showing in relation to popnlation is less favorahle, the yield of gold heing only $19.84, silver, $1.25, and that of hoth the precions metals only $21.09 per capita, placing California fifth as to gold, and eighth as to silver and the total, in the rank of the United States. The prosperity of the Stats is not, however, dependent npon its mines in the same degree as formerly, agriculture and mannfacturing having outstripped the earlier industry.

There are a larger numher of actively working mines in California than in any other State or Territory, as, owing to the settled condition, transportation facilities, and comparative cheapnese of labor and supplies, it is possihle to mine deposits of lower-grade than could he made profitahle in localitiee having loss advantagee of position. The resnlt is that there are, hesides a few large incorporated companies, a great many mining properties worked on the small scale, hut still profitably, hy individual owners. The collection of accurate statistics regarding these smaller claims is a very tedious and also somewhat uncertain matter. Schedule returns were received from 128 deep mines, 147 placer mines,

CALIFORNIA—Production of Deep Mines for the Year Ending May 31, 1880.

COUNTY.	Ore raised during census year.	Average assay value per ton. Gold.	Silver.	Gold and Silver.	Total assay value of ore raised during census year. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Amador	114,648	14.62	.....	14.62	1,675,585	.....	1,675,585
Calaveras	42,628	10.74	.....	10.74	458,131	.....	458,131
El Dorado	4,520	26.76	.....	26.76	120,964	.....	120,964
Fresno	573	150.00	13.00	153.00	86,700	7,514	94,214
Inyo	6,714	5.01	69.66	74.67	33,634	467,744	501,378
Lassen	2,079	21.08	.63	21.71	*43,828	*1,305	*45,133
Los Angeles	200	.....	160.00	160.00	.....	32,000	32,000
Mariposa	16,660	17.10	.....	17.10	284,920	.....	284,920
Mono	57,211	51.95	10.59	62.54	2,972,053	606,145	3,578,198
Nevada	58,433	21.91	.49	22.40	1,280,365	28,868	1,309,233
Placer	3,000	25.00	.....	25.00	75,000	.....	75,000
Plumas	113,879	9.03	.09	9.12	1,028,913	10,146	1,039,059
San Bernardino	489	20.45	170.90	191.35	10,000	83,573	93,573
San Diego	16,513	22.36	.....	22.38	369,250	.....	369,250
Shasta	5,010	*15.96	*13.48	*29.44	*127,800	*108 000	*235,800
Siskiyou	22,290	12.20	.44	12.64	271,914	9,331	281,245
Trinity	800	*35.00	.....	*35.00	*28,000	.....	*28,000
Tuolumne	10,406	15.11	.38	15.49	157,186	*4,000	161,186
Total	479,028	18.84	2.84	21.68	9,023,843	1,338,626	10,382,469
Additional production, estimated from transportation statistics	*65,213	*18.84	*2.84	*21.68	*1,228,613	*185,205	*1,413,818
Grand Total	544,241	18.84	2.84	21.68	10,252,456	1,543,831	11,796,287

COUNTY.	Ore raised and treated.	Average yield per ton. Gold.	Silver.	Gold and Silver.	Bullion produced from ore raised and treated during census year. Gold.	Silver.	Totals.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Amador	108,136	12.49	.....	12.49	1,350,546	.....	1,350,546
Calaveras	40,503	8.58	.....	8.58	347,650	.....	347,650
El Dorado	4,520	21.21	.....	21.21	96,830	.....	96,830
Fresno	573	120.00	10.40	130.40	69,360	6,011	75,371
Inyo	6,714	3.83	35.62	39.45	25,704	239,145	264,849
Lassen	2,079	16.71	.50	17.21	34,739	1,037	35,776
Los Angeles	200	.....	147.00	147.00	.....	29,400	29,400
Mariposa	16,660	10.69	.....	10.69	188,050	.....	188,050
Mono	57,108	48.44	8.33	56.77	2,766,238	475,626	3,241,864
Nevada	58,433	15.21	.33	15 54	888,908	19,053	907,961
Placer	3,000	20.00	.....	20.00	60,000	.....	60,000
Plumas	113,879	6.63	.06	6.69	755,277	7,251	762,528
San Bernardino	389	.....	164 55	164.55	.....	64,050	64,050
San Diego	16,513	14.40	.....	14.40	237,850	.....	237,850
Shasta	7,880	12.08	*11.34	23.42	95,200	*89,397	184,597
Siskiyou	22,290	9.11	.31	9.42	203,204	6,818	210,022
Trinity	800	27.50	.....	27.50	22,000	.....	22,000
Tuolumne	10,406	12.32	.29	12 61	128,260	3,000	131,260
Total	470,088	16.10	2.00	18.10	7,269,366	940,788	8,210,654
Additional production, estimated from transportation statistics	* 65,213	*16.10	*2.00	*18.10	*1,049,925	*130,426	*1,160,351
Grand total	535,301	16.10	2.00	18.10	8,319,791	1,071,214	9,391 005

COUNTY.	Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year. Gold.	Silver.	Total.	Bullion produced during census year from ore previously raised. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Amador	6,482	25,870	.....	25,870	56,500	.....	56,500
Calaveras	2,125	27,125	.....	27,125	1,000	.....	1,000
Fresno	.....	.....	.....	.....	3,240	231	3,521
Mariposa	.....	.....	.....	.....	134,225	.....	134,225
Mono	103	2,854	1,213	4,067	.....	900	900
Placer	.....	.....	.....	.....	8,000	.....	8,000
Plumas	.....	.....	.....	.....	44,498	27	44,525
San Bernardino	100	10,000	8,200	18,200	.....	1,065	1,065
Shasta	130	13,000	.....	13,000	1,200	8,939	10,139
Tuolumne	.....	.....	.....	.....	1,511	189	1,700
Total	8,940	78 849	9,413	88,282	250.174	11,401	261,575

*Estimated.

*In each of the tables of production and throughout this discussion the following explanations apply: The short ton of 2,000 pounds is invariably used. The ore tonnage is stated in gross tons; the assay values are of net tons, without allowance for moisture. Mint values are assumed in all cases. The weight of bullion is given in troy ounces of fine metal. The gold ounce is taken at $20.671834 and the silver ounce at $1.2929. A statement of the estimated market value of the silver is elsewhere appended. No account is taken of the value of the silver alloyed with placer gold in the primary production tables, as, with very few exceptions, no allowance is made for it in selling. This is treated of separately and the proper addition made in the final summary. The bullion yield is given according to the county in which the ore producing it was raised, without regard to the locality where the ore was reduced. This method of stating the product apportions it with reference to the original source, so far as it is practicable to trace it. Were the yield to be credited to the reduction works, Omaha, Chicago, St. Louis, Newark, New York and other points remote from the mines, would appear as large producing centers.

Individual estimated amounts are designated by an asterisk (*), and where such estimates form a considerable proportion of the totals the fact is similarly indicated.

California—Production of Hydraulic, Placer, Drift and River Mines for the year ending May 31, 1880.

County.	Gold.
Butte	$ 325,175
Calaveras	96,450
Del Norte	122,331
El Dorado	*514,269
Humboldt	77,000
Mono	25,200
Nevada	42,631
Placer	289,369
Plumas	164,259
Shasta	450,433
Siskiyou	433,991
Stanislaus	62,650
Trinity	778,000
Tuolumne	*559,828
Yuba	1,042,349
Total	$5,039,935
Additional production, estimated from transportation statistics	*3,541,054
Grand Total	$8,580,989

*Estimated.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

A TURNED LEAF will point ont the article supposed to be of special interest to persons receiving sample copies of this paper.

ANNUAL STATISTICIAN of 1882.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 502 Taylor st. Price, $4.

Mining and Other Companies.

Persone intereeted in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Bullion Mining Company.—Location of Principal place of business, San Francisco, California. Location of works, Gold Hill Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 29th day of March, 1882, an assessment (No. 23) of Thirty (30c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 3, Safe Deposit Building, 328 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the second (2d) day of May, 1882, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the twenty-fourth (24th) day of May, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. M. BRAZELL, Secretary.

Office—Room 3, Safe Deposit Building, No. 328 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, April 1, 1882.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 40, of seventy-five cents (75c) per share was declared, payable on Wednesday, April 13, 1882, at the office in this city, or at the Farmers' Loan and Trust Company, in New York. WM. WILLIS, Secretary.

Office—Room No. 29 Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

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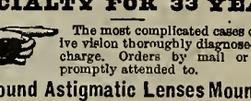
1863  1882

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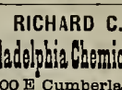

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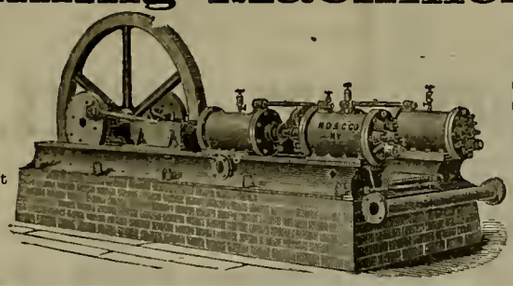

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DONKEY ENGINES For Pile Driving.

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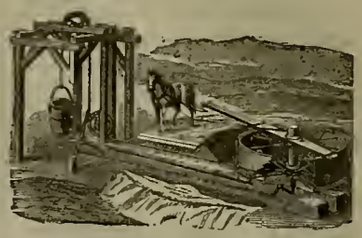

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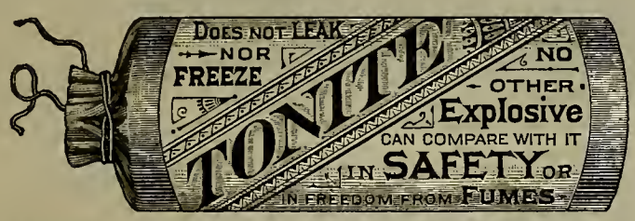
From Black Hills "Pioneer," March 21, 1882.

The miner who was so horribly mutilated by an explosion of a stick of Giant Powder at the Grand Junction was not chopping the stick, as reported. He was rolling it between his hands to warm and soften it. This terrible accident should teach those who handle this explosive that too much care cannot be observed, There are very many foolish ideas concerning Giant Powder that are liable to lead to accidents.

From Black Hills "Pioneer," March 28, 1882.

On Saturday, James Seeley had several sticks of Giant Powder in his boot legs and went into the blacksmith shop, when a spark of fire from the forge set his pants on fire, the powder also catching and burning his leg quite seriously. When the other boys discovered the fire there was a scattering from that shop too lively to talk about.



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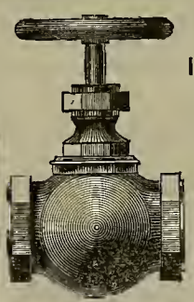

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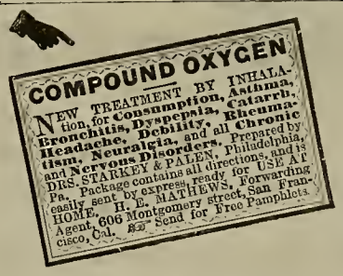
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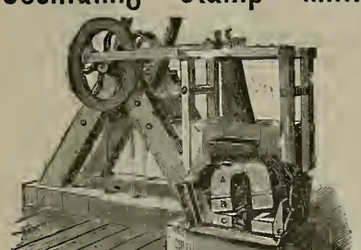
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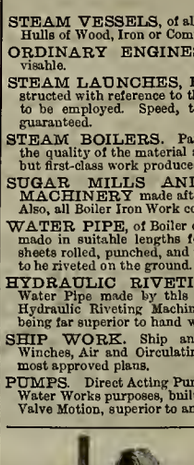
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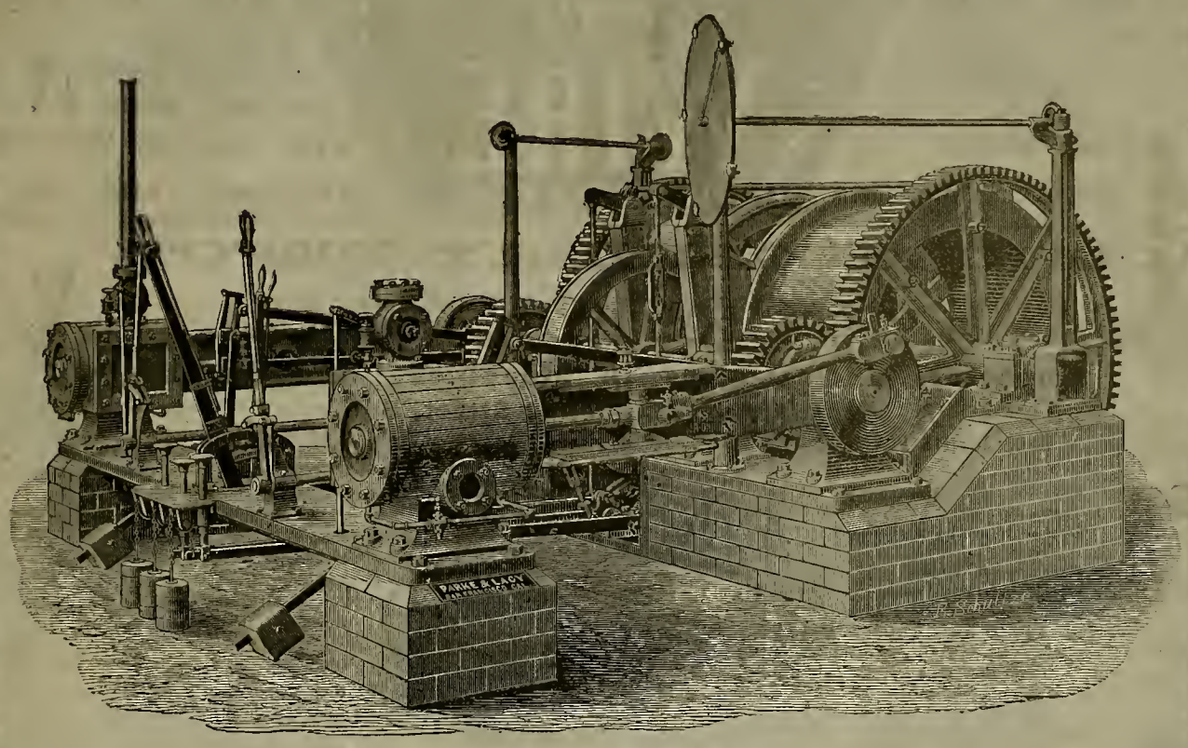

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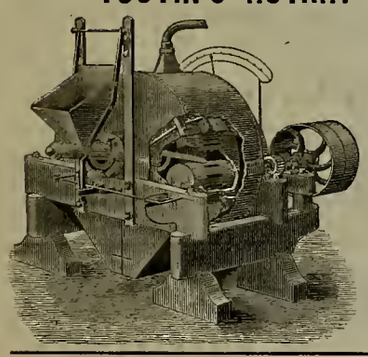

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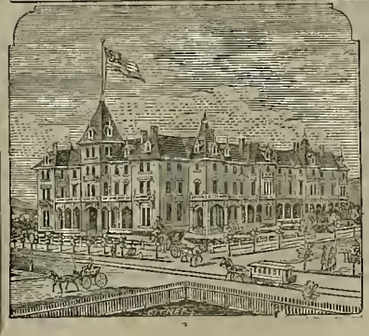

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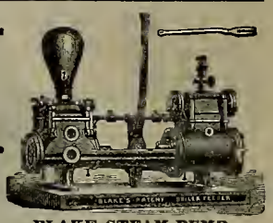

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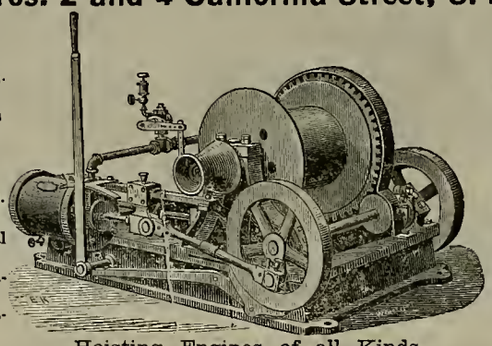

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ALL POWDERS manufactured by the California Vigorit Powder Co. are SUBMITTED during the course of manufacture TO SCIENTIFIC and accurate TESTS for safety and strength.

They are tested for Safety against Friction, Fire, a Temperature of 212° Fahr., and the various shocks to which Powder is liable in practical handling.

The following qualities are common to all grades of Powder manufactured by the Company:

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Stronger, Better and Safer than any other High Explosive

Judson Powder

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It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞Triple Force Caps and all Grades of Fuse.

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Inventors L. PETERSON **MODEL MAKER.**
328 Bush St., bet. Montgomery & Kearny, up-stairs, S. F. Experimental machinery and all kinds of models, tin, copper and brass work.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, APRIL 15, 1882.

VOLUME XLIV Number 15.

Barrel Amalgamation.

In working silver ores on this coast hy harrel amalgamation, the following process has heen carried ont: The barrels are charged with abont 2,000 lbs. of ore, mixed with water enongh to make a moderately thick paste. Before adding quicksilver, the charge is revolved for two or three honrs in the harrel with several hnndred ponnds of scrap iron. The object of this is to effect a partial reduction of the chlorides present, which wonld otherwise be performed at the expense of the qnicksilver. The chloride of silver is partly rednced hy the metallio iron, and is subsequently amalgamated hy the qnicksilver. The same is true of the lead and copper. Qnicksilver is added according to the richness of the ore, nsnally varying from 250 to 500 or more pounds.

The harrel is rnn two honrs at 12 or 15 revolutions a minnte, and then examined, that the consistency of the paste may he ascertained. If the latter is too thin, the qnicksilver settles on the hottom. This condition is remedied hy the addition of more roasted ore, while, if too thick for the most favorahle disposition of the qnicksilver, more water is added. The harrel is then allowed to revolve again for 14 honrs, making 15 revolntions per minnte. The whole time occnpied from the charging to the discharging of the harrel is 18 or 20 honrs.

When the amalgamation is complete, the paste is thinned hy the addition of water, and the qnicksilver and amalgam are thns allowed to collect on the bottom of the harrel. Below the harrels is a large hopper, or funnel-shaped contrivance, sloping down from the fonr sides to a common center. When a harrel is to he discharged, a small plng in the side is loosened while tnrned npward, and when the harrel is revolved so that the plng is downward, it is drawn ont hy hand. The qnicksilver and amalgam are discharged into the hopper or funnel, and are allowed to run from the harrel nntil the pnlp hegins to follow, when the plng is replaced.

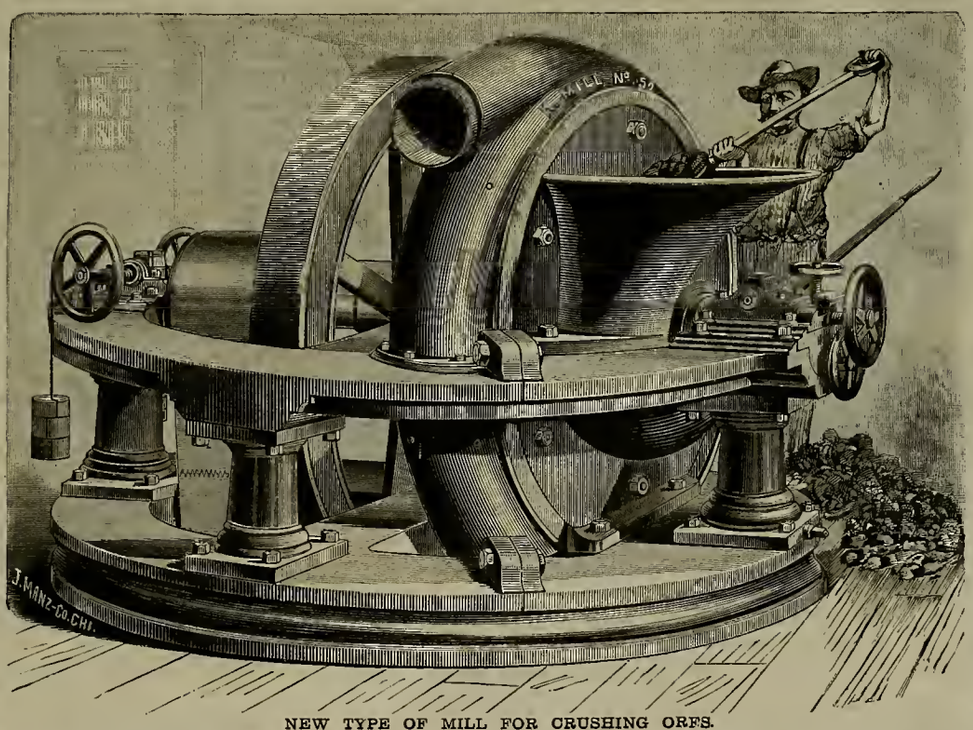
When all the harrels ready for that pnrpose are discharged, the amalgam in the hopper is carefnlly collected and washed, and afterward cleaned in a common pan like those in nse in other mills for similar pnrposes. The etraining of quicksilver and retorting of amalgam is performed in the nsnal manner. After the hopper below the harrels has heen cleaned of all the qnicksilver discharged into it, the residue is permitted to flow from the harrels and to run down into a large agitator, 8 or 10 ft. deep and 12 or 15 ft. in diameter, in which stirring arms are revolving. By this means the nnseparated qnicksilver and amalgam are allowed to settle, and the concentrations of this vessel are worked over in pans in the common way, while the mass of tailings, passing from the settler, are subjected to further methods of concentration and subseqnent treatment.

THE immigration hy ocean steamers to Oregon is now ahont 4,000 per month. Of these ahont 80% are sctnal settlers, who hring with them from $500 to $1,000 each, and nsually their honsehold effects. Ahout one-third go to the Umpqua and Rogue River valleys, in southern Oregon, the remainder heing equally divided hetween Walla Walla valley, the Palouse rogion, Yakima connty, Umatilla county, Oregon, and the plain hetween the Northern Pacific railroad and Columhia river.

IT oosts thie country eight hnndred times as muoh for intoxicants as it doee to pay salaries of the olergy. The figures are $2,200,000,000 and $60,000,000.

A New Ore Mill.

We present two engravings of a new and powerfnl grinding mill, made hy the Northwestern Fertilizing Co., Chicago, Ill., for the purpose of grinding all hard snhstanoes, such as rock, iron or gold ore, cements, eto. The advantages olaimed for the mill are simplicity of constrnction, economy in grinding, a large capacity for work and the complete adaptation of the mill to any class ot grinding reqnired. It is adjusted to any grade, fine or ooarse, hy means of a simple set screw. By a mechanical device in the construction of the mill, when large pieces of iron enter, the grinding faces open five inches, and the iron is thrown ont withont snstaining any injnry whatever. Its capacity for grinding



NEW TYPE OF MILL FOR CRUSHING ORES.

rock to a 60-mesh screen is one ton per honr—20 tons in 20 hours.

The grinding faces are made of metal that resists the wear; hnt the great advantage is in the constrnction of the mill in making the rock pulverize itself, rather than hy ruhhing against the grinding faces. The cost of repairs is reduced to a minimum, the grinding faces having run, we are told, three months on rock withnut renewal.

It requires ahout 25-horse power to run the mill to its fnll capacity. No foundation is reqnired or holts needed to hold the mill in place. Its weight, 23,000 lbs., holds it in position. When in motion it is noiseless. The ores must he dry when ground. This mill is its own crusher, and no preparation of the rock is required. The illustration on this page shows the mill closed ready for work. The engraving, on page 249, shows the mill open with grinding faces exposed. The mannfactnrers have heen running this mill on rock for the past 18 months and, from their experience, they helieve the mill stande without a rival, for capacity and economy in redncing gold, iron, or other ores to powder. They inform ue that they are now grinding iron ore through 60-mesh screen, at the rate of one ton per hour.

A MINE called the "Little Devil" hrought $6,000 in a sale at Tombstone the other day.

Phosphorescent Rock.

At the meeting of the San Francisco Microscopical Society this week, Mr. H. G. Hanks, State Mineralogist, read the following paper:

Some time since, D. B. Hnntley, of the Geological Corps of the Tenth Census of the United States, hrought to the State Mining Bureau a mineral, with the statement that it had shown certain peculiarities which led the miners to call it hy the rather startling name of "Hellfire rock."

The property known to mineralogists as phosphorescence is not confined to one mineral species, nor is it very nncommon. Bnt in this specimen it is so strongly marked that there is some excuse for the refusal on the part of some of the miners to work in the mine. When striking their picks into this formation, flashes of light were seen, which they regarded with enperstitious alarm.

The locality in detail is, Shenandoah mine, Snake Creek district, Wasatch oounty, Utah.

A chemical examination shows this mineral to he an impnre dolomite. It is interesting, not only from its remarkahle phosphorescence when rnhhed with any hsrd substance in the dark, hnt from its heautifnl crystalline appearance under the microscope, and the ease with which it can he rednced to a crystalline powder, even hy crnshing hetween the fingers.

In Cleveland's Mineralogy we find it stated that eome varieties of dolomite are phosphorescent in the dark, either hy friction or when thrown on a shovel which has heen allowed to cool just helow the point of redness.

The lights heing turned down, Mr. Hanks produced the phosphorescence heantifully hy scratching the specimen with a knife-hlade. It was of a hright reddish-yellow or orange color, and it was olearly seen how a miner conld he agitated hy striking snch infernal material in his ouhterranean walks.

LEAD hars are now ehipped regnlarly from Palisade to New Orleans hy way of the Sonthern Pacific railroad. Satnrday ten cars of this metal were here at one time. It looked strange to old settlers to see freight hilled on the Humboldt sent west to New Orleans hy rail.—*Winnemucca Silver State*

[illegible] Ores.

What becom[illegible] thousand dollars a ton" mines that [illegible] every year? At what mills are the ores [illegible] try these high percentages of [illegible] a day passes, that we do not see in some journal that the lucky prospectors, so and so, have found a claim, the ore of which is very rich, assays way up in the hundreds or the thousands.

The strange thing is, we never hear of the mines again. When a mill begins to experiment on the rock, it tells a different story from what the assayers' scales did. If $500 rock proves $50, it pays first rate as a general thing, but the percentage even is seldom maintained.

The truth of the matter is, it is not the "rich" mines, hnt those with plenty of ore that pay. If the ore will pay a fair profit, over and above expenses, the mine is apt to he very mnch more profitable than when a few tons figure np high in the thousands. Mines with many tons of rich ore are all phenomenal. They occur so seldom that they are scarcely worth taking into account in prospecting. Of course, we naturally, when hnnting for a prize, want the higgest one there is to he had; hnt we ought not pass hy a small one in looking for a large one.

These olaims, with ore which assay way up in the thousande, very seldom prodnce mnch of it. After one discounts the selected specimen, for what an average would be, and discount the assay valne from the real value, and the real value from what it will mill, we find we have hronght it down considerahly.

It is not hest, therefore, for men to he too sangnine when they hear of high assaying rock. It is true, a long array of figures on an assayer's certificate has a charm for many, and produces an excitement it is difficult to overcome. But even the most self-deceiving prospector will acknowledge to himself that the figures are safer on the paper than if hronght to the test. He will trot around and try to sell a mine for a price that a dozen or two tons of the presnmed rich ore wonld yield. If miners will hut consider the snhject, they will remember that the most famous mines which have paid their millions, are those which have yielded ahundantly of an average ore; and that these mines last longest also. The thousand dollar a ton claim, does not last very long.

DEATH OF REV. L. HAMILTON.—The friends of Rev. Lanrentine Hamilton, in all parts of the State, will he pained to learn of his sudden demise last Snnday morning. While reading his sermon he was stricken with serous apoplexy in his pulpit, and died without recovering conscionsness. Rev. Mr. Hamilton was greatly loved hy his people, and his death causes profound grief. Memorial services were held last Snnday in the Iodependent church, Oakland, and further services, significant of the hereavement of the chnrch, will he held next Sunday afternoon.

THE Bonanza Gravel claim at Howland Flat, says the *Mountain Messenger*, averaged in their last clean np $150 to the carload. We hear there is now a fair proepect of soon discovering the lost pay-channel, and sincerely trust that such may he the case, eo that our venturesome English oousine over the waters may ohtain a handsome interest on the large sum they have risked in developing our gravel depoeits.

A FURNACE is to he erected at Soda springs, Nev., to reduce copper ore.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Northern California Mines.

A Rich, but Neglected Region.

Editors Press:—I have been a subscriber and reader of the Press for many years and have often noticed the limited amount of mining news from this, the northern portion of the State, in the Press; more especially so for the reason that Siskiyou, Trinity and Shasta counties are, in a manner, strictly mining counties, and have been for over 30 years constantly contributing to the golden wealth of the world. Seeing your very broad and earnest solicitations for mining news in your issue of the 11th inst. from all quarters, I venture a few words from this portion of the State in its behalf.

It would seem to one who is and has been acquainted with northern California mining, its product, etc., for 25 or 30 years, and to one who has kept pace with the product of the precious metals on the Pacific coast, that northern California and south Oregon had been, in a manner, entirely overlooked. At the same time its golden treasure went forth each year to swell the worlds' riches.

The mines in this part of the State are principally placer. Although much gold has been taken from quartz, there are but few of the latter that have proved extensive as yet. Among them I might mention the well-known Black Bear Quartz Mining Co., which ranks first among the best dividend-paying mines in the State. We feel the absence of capital to open up a few more mines of this character, from the fact that the mines generally in this country are operated by many men of small means who, like all miners did in early days, took the gold from their sluices every night when their day's work was done, and when it ceased to pay satisfactory wages, it was abandoned, and a new and more accessible place was sought. In other words, whenever it required much outlay of labor or capital to open up the mine properly, it was abandoned. Such has been the condition of things in this part of the country for many years. This leaves a good large field for capital and enterprise, but there has been no one to talk it up or bring it to the notice of capitalists—another thing that has been against its advancement. Legitimate mining was a thing that few looked for; speculations in mining stocks absorbed all the attention and capital.

Things have certainly reached the turning point, and with the building of railroads through the more remote portions of the State (and the disastrous operations in stocks will certainly bring about the desired change), we shall look forward with much interest to a more legitimate state of affairs.

A friend of mine, a merchant in this part of the country, when in conversation with him, a short time ago, in regard to getting capital interested here, said when he was in San Francisco buying goods he was telling a capitalist of our resources in mines, and really got the capitalist interested; but when he informed him that to get to our country he would have to ride 125 miles over a mountain road in a stage-coach, and then take it muleback perhaps twenty to fifty more, he didn't want any of that in his; but if he could take a sleeping-car and ride to the spot, he might come and take a look at it. But capital is coming, and will continue to come; so will railroads.

Our mountain valleys here are very productive. Though small, they are well cultivated, and the product is sold at their doors to supply the mines surrounding. The supply is generally more than equal to the demand, though, as a rule, prices rule on an average with prices in the Sacramento valley.

There are several things in favor of northern California's mines that do not exist in many other mining sections. We can boast of the best watered country in the State. These high mountains hold in store a wonderful supply of snow. The streams during the summer months are torrents. These streams are not tributaries to the Sacramento river, where the debris is so much disliked, but put into the Pacific ocean direct, thereby giving no offense to the farmers nor interfering with any navigable streams. There are chances for companies with capital to operate on an extensive scale, where large returns are sure to follow. It wants enterprising men to look them up and bring them to the notice of capitalists.

Miner.

Scott Valley, March 27, 1882.

Damage from Powder.—H. A. Heywood, acting as drummer for the Thunder Powder company, and relying on the company's representations concerning its safety, tamped some of it in a hole some time last year, while trying to effect a sale in Utah, and an explosion took place. Heywood lost one eye, had the other permanently injured, and lost 15 teeth and a portion of his upper jaw, besides having his left arm badly broken. He now sues the company for $20,000 damages.

Tintic is now receiving considerable attention from mining operators. The out-put of that district will be large this season.

On the Estimation of Small Traces of Gold.

The following by Nelson H. Darton is from the *Scientific American:*

It is of considerable interest to geologists, as well as prospectors, to note the rocks containing mere traces of gold; and as they are very abundant even in this State, we often meet with them. There is a porous gneiss at Inwood, New York city, containing appreciable amounts of gold, sintered down from elevations in the north as placer deposits of very weak intensity, and become fixed in the rock. This origin is clearly shown, as there was a very gentle slope through the State, and the amount of gold, probably limited to commence with, was thus widely disseminated over this incline and there fixed by deposits above it, and came into intimate contact with the rock by infiltrating waters taking it into solution and depositing it through the mass. Fissures and basins occurring in several of the counties in northern central New York intercepted and concentrated parts in its downward movement of the richer portion of ore, and thus gave in places the rich indications and yields.

There have been a number of methods proposed to detect the minute quantities of gold occurring in the rocks mentioned above, and in ore tailings, etc.; and having examined and tested every method I have known to have been suggested, I have come to the conclusion that the one noticed below yields by far the most satisfactory results if the details are carried out, and is the most practicable in the field or in the laboratory. I know of no compound which would be formed from natural products by the method which would mislead by staining the ash a color at all similar to the distinctive purple of finely divided gold.

Small parts are chipped from all the sides of a mass of rock, amounting in all to about a quarter of an ounce. This is finely powdered in a steel mortar and well mixed. About half of it is placed in a capacious test tube, and then partly filled with a solution made by dissolving 20 grains of iodine and 30 grains of iodide of potassium in about an ounce and a half of water. The mixture thus formed is thoroughly agitated by shaking and warming, and then, after all particles have subsided, dip a piece of pure white filter paper in it, allow it to remain for a moment, then let it drain, and dry it over the spirit lamp. It is then placed upon a piece of platina foil held in a pincers, and this heated to redness over the flame; the paper is speedily consumed; and after heating further, to burn off all carbon, it is allowed to cool, and then examined. If at all purple, gold is present in the ore, and the relative amount approximately deduced, as much, fair, little, or none. This method takes but little time and is very trustworthy.

Mining Decision Endorsed.

An Iowa Hill correspondent of the Placer *Argus* says: A jollification meeting was held at this place last evening on receipt of the news of Judge Myres' decision in favor of S. B. Drury and Prof. W. P. Blake, in the mining suit of Byrnes vs. Drury. The citizens of the Hill, in order to express their satisfaction with the decision, fired a salute of 75 guns, and gave three rousing cheers each for the Judge and for Messrs. Fulweiler and Tuttle, the able attorneys for Drury; also three more for Prof. Blake.

This case was tried in the February term of the Superior Court, and the decision rendered by His Honor gives entire satisfaction to the majority of respectable citizens of this divide. It is a case which has been watched with great interest for several reasons. First, the property in dispute is a quartz ledge formerly known as the "Garrity" or "Gray Eagle" ledge (now known as the "Providencia"). It was known to have been abandoned by all former owners and claimants for the past 20 years. Drury relocated it Oct. 16, 1880, and induced Prof. Blake to invest in it, in order to develop the mine. When it was found that it was likely to become valuable property, suit was commenced against Drury and Blake.

One of the great drawbacks to this divide is that men claim large amounts of valuable mining property, who have not spent a dollar on them for the past 25 years, nor have they any legal right to them; but should parties relocate the same with the intention of investing capital to develop them, such suits as the one just decided are commenced, thereby retarding their development for years. For this reason the citizens of this divide rejoice at the just decision of the Hon. B. F. Myres.

Day Company.—The Day mine is developing into one of the richest mines in the country, containing a large quantity of high-grade ore. Work of development is being vigorously pushed ahead. They will commence repairing their furnace on the 1st of April, and it will probably start up the latter part of the month. The run will probably be for 60 days. A couple of directors of the company are expected to arrive here on or before the 10th of April, when it will be decided at what place in the vicinity of Royal City the new furnaces will be erected. We are of the opinion that they will be erected down in the valley, a little this side of the 15-mile well, where an abundance of water can be obtained beyond a doubt. The little town which will grow up in the vicinity of the furnaces will not be monopolized as a "company."—*Pioche Record.*

New Method of Purifying Copper.

Successful experiments, described in the December number of the *Comptes Rendus*, have recently been made by M. J. Garnier, at the works of Messrs. Lavsissiers et Fils, Deville, near Rouen, with the purpose of removing arsenic and antimony in the commercial copper. From a theoretical standpoint the method now generally employed might be more satisfactory. The refining hearth is covered with silica, supposed to absorb the arsenic and antimony which are oxidized during the process, and to make them go into the slag. In reality this combination is formed very imperfectly, and an amount of two one-thousandths of arsenic is considered sufficient to impair the quality of the copper.

Mr. Garnier's process in some respects resembles the Thomas Gilchrist process. He employs a sole of chalk and tar, over which, for each separate operation, he places a false sole of limestone and manganese peroxide. With the melting of the copper a generation of carbonic acid and oxygen begins from the upper sole, which oxidizes the charge. As soon as the metal is sufficiently liquid, the lime and manganese protoxide rise and dissolve the arsenic acid. By this one operation, the amount of arsenic, according to M. Garnier, is reduced to one-fifth. Subsequent fusions with basic fluxes are said almost completely to eliminate the arsenic. An analysis of a cement copper of Rio Tinto is added. Of 0.8% of arsenic, only 0.023 could be determined at the end of the third operation, the amount of iron contained being at the same time all but removed. No mention is made in this analysis, of antimony. As special advantages of this system, M. Garnier claims that the roasting of the black copper becomes unnecessary, and that the loss of copper arising from parts of the copper combining with the silica of the slag is avoided.

The Season's Prospects.

The most important consideration to people just now is the prospect of business during the approaching season, says the Bodie *Free Press*, and it may be profitable to look over the field with a view to forming an opinion upon that point. It may safely be predicted that more work will be done in Bodie District proper, during the present season, than during that which has closed. The very promising appearance of things at the south end certainly insures a continuance of operations in the mines which are now running, and the probabilities are that in other claims which have been shut down work will again be resumed. Without reference to the stock aspect of the Noonday development, which of course no one can forecast, its importance to the business interests of this community, cannot well be overestimated. Should we be so fortunate as to open a bonanza on the eight hundred level of the Bodie and Mono, or should the rich vein below the sixth level of the Bodie widen out a little as it goes down, we would soon experience such prosperity as we have not known for many a long day. The finding of ore in the thousand level of the Standard, or below, would have a similar effect. The crosscuts in Oro or Goodshaw, and the approaching eight hundred level from the Red Cloud, may either one cut an important figure in this spring's operations. In the meantime the Standard will continue to crush its twelve hundred tons of ore per week and declare its regular monthly dividends. The building of the extension of the narrow-gauge railroad from Mono Mills to Benton will employ a good many men, and a considerable amount of supplies will be purchased from our merchants in Bodie.

Outside of Bodie, mining operations to a considerable extent will be carried on in other portions of Mono county, and in the adjoining county of Esmeralda. It is understood that several strong companies will take hold of Lundy properties during the coming season, where, it may be proper to state, the most flattering inducements are held out to capitalists. The Great Sierra Co. will continue its extensive operations at Tioga district, and it is probable that some work will be done in Jordan district during the year. The camp which is likely to the attract most attention, however, and in which most extensive prospecting will be done, is Sweetwater, or Patterson district, as it is more properly called. Dr. Summers is doing unexpectedly well with his little mill, where he has an ample supply of ore on hand to last until he will be able to again work the mine. It would be gratifying to see one or two large companies engaged in Sweetwater, where there is every assurance of a great mining district.

At Aurora it is understood Governor Blasdel's milling operations are turning out quite satisfactorily, which must conduce to give that camp renewed life. The extension of the railroad to Benton and the country south will impart fresh impetus to mining enterprises in that great mineral section.

Indeed, in looking over the mining field in every direction, north, south, east and west, toward distant Idaho and Montana, Arizona, New Mexico and Colorado, we fail to note any which offers superior attractions for the prospector and for the capitalist to those which can be presented in this immediate section, embraced in the counties of Mono and Inyo, California, and Esmeralda county, Nevada.

In Candelaria, Nev., the water company sells water at five cents a gallon. Enterprising peddlers run water carts in opposition, and sell water at three cents a gallon.

Shasta County Mines.

The Shasta *Courier* says: The articls which we reproduce this week from the Mining and Scientific Press on quartz, nugget and pocket mines, is applicable to this county at the present stage of the mining boom in this vicinity, which has received fresh impetus from the discovery of the decomposed quartz strike of Brincard & Lowery, between the Gage place and Middletown, from which strike some $6,000 is known to have been realized, and also from the Zent pocket at Whiskytown from which $1,600 has been taken in a few days, and more being panned out daily. The fact is, Shasta and the vicinity surrounding the town is a most inviting field for prospecting and the investment of capital. The way the mines here, and in a radius of miles around, "pangled" in early times, bears us out in the belief that we are situated in the midst of a locality which, when the sources from which the gold already taken out are found, will be more prosperous than ever before.

At Horsetown, Muletown, Centerville and Texas Springs, innumerable nuggets and rich pockets have been found. On Tadpole, below the reservoir, an immense nugget was taken out in 1855, sold to Callahan and exhibited at his store. Oregon gulch has yielded many nuggets, G. R. Knox taking out the "boss" one in 1856. At the falls of Buckland gulch, half a mile from Brincard & Lowery's bonanza, a miner by the name of Curtiss took out $600 in two days. Nuggets worth from $1,100 down have been found in quartz at Middletown. At Salt Creek, Lower Springs and Middle Creek, countless nuggets and specimens have been taken out.

The Dannels pocket, on the hill just back of the Sweetser place, yielded a snug fortune. At Bunker Hill, at the mouth of Middle creek, mule-loads of quartz gold have been taken out, and fortunes still remain embedded there. Lucas, who owns seam diggings on the creek, takes out some very good-sized nuggets occasionally. Rock creek has always abounded with nuggets and pockets, and it was not long ago that E. L. Reese realized about $500 from a small quartz seam near the hospital. On Spring creek, several years ago, Fred Rochon and partners found a number of nuggets, the largest of which weighed $3,300, and was on exhibition here. Flat creek has, and still does, shell out the nuggets and quartz specimens. Whiskytown, Oak Bottom, Mad Ox, Mad Mule, French Gulch, etc., are just "lousy" with rich seams, pockets and pot-holes filled with gold. But we need not particularize, and only make the above mention to show that Shasta has been, still is, and always will be, the center of an extensive and very rich mineral territory. Surrounded with such bonanza mines as the Banghart, Mad Ox, Iron Mountain, Brincard, and the thousand-and-one other mines of present lesser note, Shasta certainly has a bright future before her, and all the more so on account of the activity which is now pervading mining circles here and everywhere. The old cry that the "mines are played out" is itself played out. While the Redding *Independent* exclaims, "Thank God! we have no mines," old Shasta lifts a grateful face to the throne and fervently thanks God that we do have and are surrounded with mines.

The Grand Lodge, A. O. U. W. of California, met in Dashaway hall Tuesday morning, Grand Master Barnes presiding, and a full representation of lodges being present. One hundred and seventy-four members receiving the Grand Lodge degree. The call of the roll showed a representation from all the lodges but 18, and the attendance to be about 275. The Grand Recorder's report shows that there were 3,529 admissions during the year; losses by death, 96, and by withdrawals, suspensions and expulsions, 622. The average duration of the losses was one and a half years, and the average aggregate payment of each to the beneficiary fund was about $22.50. The Order gained or saved during the year from lapsed or annulled certificates, $13,995. Only 88 of the deaths during the year were officially reported before its close. Fourteen assessments were levied during the year to meet the death calls. The causes of death were: Accidental, 13; consumption, 8; pneumonia, 8; suicide, 6; heart disease, 5, and the remainder from various diseases. The report of the Grand Receiver shows that he had received $280,000 and had disbursed $260,000 during the year. Grand Master Barnes' report was strong against intemperance, stating that it was not consumption, heart disease or Bright's disease that the Grand Body need to spend hours debating how to guard against, but that the great evil overshadowing all of these was liquor and beer drinking, which lead to all manner of diseases, as well as to accidents, suicides and murders.

The Bodie *Free Press* says: If Professor Le Conte should visit Mono county he would find at Bridgeport veins of metalliferous quartz forming, through the action of hot springs, in the plainest and most unmistakable manner. We consider the Bridgeport hot springs one of the greatest natural curiosities on the Pacific coast, and one of the most instructive, upon the subject of the formation of metalliferous veins.

Gould's Mexican railroad has been completed from Laredo to a point 40 miles beyond the boundary, and it is expected that Monterey will be reached by September 1st.

MECHANICAL PROGRESS.

Steam Boilers.

Many of the difficulties which arise in connection with steam boilers in use are not understood by engineers in general, and, in fact, some phenomena cannot be accounted for, even by experts.

The conditions under which a boiler is used have much to do with its behavior. First, is it properly constructed, and are the parts so adapted to each other that there is no undue or unequal strain brought to bear on any particular part? This may arise from improper bracing—having a greater tension on one brace than there is on its neighbor. Joints may be so constructed that there is constant distress over their entire length. If the holes for the rivets are not fair and the *drift pin* is used to bring them fair, there is an unnatural strain brought to bear that is no part of its legitimate burden, and is not provided for in the formulæ used for estimating safe working pressures. These abnormal strains are very much exaggerated when the boiler is under pressure and the load is not evenly distributed. Hence, the portion bearing the excessive load becomes a point of weakness, and how weak can never be known until leaks, ruptures, or worse consequences follow. Many boiler explosions are no doubt attributable to carelessness in construction. The responsibility, therefore, resting upon boilermakers is a very grave one.

It is not always easy or possible to detect defects in workmanship when a boiler is finished and painted over with a coating of gas-tar, or some similar material. Another difficulty is the water used. In many cases, no trouble arises from this source, while in some sections of the country there is constant and serious trouble from water carrying more or less lime or magnesia in solution, or from a combination of both with iron and other ingredients. Hard scale or crust is formed on the fire-sheets, tubes and flues and the efficiency of the boiler is greatly impaired, besides the damage from burning the iron—thus destroying its strength. Carbonate of lime deposits as a fine powder under about 180° of heat. In some sections it is so abundant that the water becomes quite sensibly thickened by it, and it interferes with the free escape of steam.—*Industrial World.*

TENACITY OF MAGNETIZED IRON.—The influence of magnetization on the tenacity of iron was studied some time since by Signor Piazoli. Iron wires were hung between two hooks and ruptured by pouring water into a vessel suspended from them. They were about 14 inches long, and were inclosed in a spiral with four windings, one over another, which were either all traversed by a current in one direction, or two by a current in one direction and two by an equal opposite current, so that in both cases the wires were equally strongly heated by the spiral; but in one case they were magnetized, in the other not. The weights required to break wires annealed in charcoal (the weight of 1 m.—3.28 ft.—of wire being G = .66 lbs.) were, during magnetization, P = 2,772 to 2,873 lbs.; without magnetization, P1 = 2,668 to 2,794 lbs. In the case of wires annealed in carbonic oxide (G being equal to 1 012 lbs.), P was 3,811 to 3,833 lbs., and P1 = 3,748 to 3,784 lbs. In the case of wires annealed in hydrogen, P = 2,837 to 2,882 lbs., and P1 = 2,778 to 2,859 lbs. In each separate series accordingly the difference P—P1 was frequently less than the difference between the highest and lowest weights required for rupture of apparently identical wires; still, the mean values in each of the 14 series were from about 1% to 3% greater for the magnetized than for the unmagnetized wires, showing that the tenacity of iron increases on magnetization.

BOILER TESTING.—The *Mechanical Engineer*, in a recent number, discourses as follows about boiler testing: "The application of the hydrostatic test, even to smaller boilers, is now considered of rather questionable utility. The cases are not rare of leaks caused by its application to old boilers that have not wept a tear since it was last used upon them, unless, perhaps, on account of accidental low water, or the sudden introduction of cold feed water in large quantities, or some other easily recognized cause of leaks in the seams or at the tube-ends. There are many boiler owners and attendants who do not think an inspection is complete unless they see the test applied at a point at least 50% above their working pressure, and there is usually a long breath of relief taken when this or a greater pressure has been borne by the boiler for an instant even, without showing evidence of weakness. But it should be remembered that the parts of a boiler may be in a state of unequal tension, when they are unequally heated. In some complicated forms, some of the parts, in resisting the effort of other unduly expanded parts, are loaded before a pound of strain occurs from the internal pressure; which is not the case when they are at a uniform temperature throughout, either high or low. Therefore, those parts that may be overloaded when a strong fire is burning in the furnace, may be under equal strain with the other parts when the test is applied."

STORAGE OF POWER.—Col. Frederick Beaumont writes thus to the London *Times*: "Attention having lately been directed through your columns to the storage of power by means of air and electricity, and it appearing from the speeches of the chairmen of certain railway and tramway companies that misapprehension exists with regard to the cost of air, I beg leave to state that air is now being compressed to 1,000 pounds on the square inch with far less cost and difficulty than has hitherto been accomplished with steam at high pressures. Independent proof of this will shortly be forthcoming from a body of well-known scientific gentlemen who have investigated and tested the matter for themselves. For locomotive purposes, the results obtained from the storing of electricity do not approach those obtained from the storing of air in the amount of force actually available for traction or propulsion. For tramways there is no doubt of the cost of air being considerably below steam, and air could be used on the underground railway at a cost in capital expenditure somewhat in excess of that for steam engines, but in daily working the expenses would be very trifling, if any, beyond the present cost of steam, while it is obvious that the difficulties of ventilation and deterioration of girders would vanish."

THE VALUE OF THE DEPARTMENT OF WORKSHOP EXPERIENCE.—"When I was a boy, I thought the assertion that "the fools were not all dead yet" implied that at some time in the future they would all die, and that all remaining would be wise men; but time and experience have changed my views in this matter. It is evident that there are ten fools raised where one fool dies—that is, supposing the investigation to relate to any one given subject. For the more people, subjects and improvements there may be, the more it is rendered impossible for any one man to be familiar with everything, hence a man wise in some directions may be foolish in many others. Especially is this the case if he is tied up to the ten or fourteen-hour system in shop work." So writes a correspondent of a mechanical paper, who is especially pleased with the interest which practical men in every branch of industry, to write their views for publication in our technical papers. He adds: "In this way, each man may tell what he knows practically, and from it all may gain information upon matters in which they are not thoroughly posted."

NAPHTHA FOR LOCOMOTIVE FUEL.—Holland's process for running locomotives with naphtha for fuel, which was so enthusiastically heralded a year or so ago, has not yet proved successful, we are sorry to say, although the extravagant advertising in advance made us skeptical about the outcome. It is now admitted that the locomotive which has for a long time been in process of construction and reconstruction, and for which such extraordinary results were promised, is thus far a failure, though we certainly hope that the experiments will not be abandoned. Dr. Holland's theory may contain the germ of success, but he has diminished confidence in it by adopting the stock advertising methods of Keely and Proseer, and promising results with only theory and crude experiments to back him. Meantime, Gen. Haupt, of the Northern Pacific road, and a few other scientific men are proceeding quietly and cautiously with experiments in the same direction of utilizing petroleum for fuel, and the entire country is interested in their ultimate success.—*Railway Journal.*

INCREASING NEED OF BRAIN-WORK IN THE ARTS.—At a recent gathering of the spinners and weavers of a large Paisley firm, one of the proprietors gave his men an account of his recent visit to this country. Speaking of the race for industrial supremacy between the English-speaking peoples of the old and new world, and the increasingly important part played by technical knowledge and inventive power in the great competition, he said: "The time was when physical exertion alone could win the battle; but in these days of scientific research, brain power is the element of success. A workman now requires to employ his head quite as much as his hands, and with every new invention physical labor will be lessened, but head labor will be increased. You cannot read too much, and you cannot study too much, and you cannot tax your powers of thought too much. Specially would I say to young men: Never consider that your present machinery is perfect; look at it rather as crude compared to what it might be."

COMBUSTIBLE ARCHITECTURE.—In an official report by Mr. Edward Atkinson and Mr. William B. Whiting, of Boston, they mention with much satisfaction the fact that more attention is now being paid to careful construction of buildings. They also state that the old stock of combustible churches, hotels, schoolhouses, hospitals and asylums is being consumed at an unusually rapid rate. In previous years this destruction has been at the rate of one church per week, and one hospital, almshouse, insane asylum or schoolhouse per month. In 1881 this was very much exceeded. In their concluding remarks they appear to think that if this rate is kept up for a few years longer, a salutary lesson will be taught, the old stock of combustible buildings be reduced and a new stock take their place more in accordance with our present knowledge of the law of fire-proof construction.

SCIENTIFIC PROGRESS.

Can Insects Discriminate Different Colors?

A few years ago, when the problem of the connection between flowers and insects still remained much in the state where Sprengel left it at the end of the last century, it would have seemed quite impossible to answer this question. But nowadays, after the full researches of Darwin, Wallace, Lubbock and Hermann Muller into the subject, we can give a very satisfactory solution, indeed. We now know, not only that the colors of flowers as a whole are intended to attract insects in general, but that certain colors are definitely intended to attract certain special kinds of insects. Thus, to take a few examples only out of hundreds that might be cited, the flowers which lay themselves out for fertilization by miscellaneous small flies are almost always white; those which depend upon the beetles are generally yellow; while those which bid for the favor of bees or butterflies are usually red, purple, lilac or blue. Certain insects always visit one species of flowers alone; and others pass from blossom to blossom of one kind only on a single day, though they may vary a little from kind to kind as the season advances, and one species replaces another.

Certain blossoms which lay themselves out to attract wasps are, as Muller quaintly puts it, "obviously adapted to a less æsthetically cultivated circle of visitors." And some livid red flowers actually resemble in their color and odor decaying raw meat, thus inducing bluebottle flies to visit them and carry their pollen from flower to flower. Down to the minutest distinction between species, this correlation of flowers to the taste of their particular guests seems to hold good. Hermann Muller notes that the common galium of our hedges is white, and therefore visited by small flies; while the lady's bedstraw, its near relative, which is yellow, owes its fertilization to little beetles. Mr. H. O. Forbes noticed on one occasion that a particular bumble-bee sucked the honey from 30 purple nettles in succession, passing, without noticing them, all other flowers in the neighborhood. Sir John Lubbock long ago convinced himself by experiments in placing glass covered with honey upon yellow, pink or blue paper, that

Honey Bees Could Discriminate Colors,

And that they display a marked preference for blue above all other colors. The fact is, blue flowers are, as a rule, specialized for fertilization by bees, and bees therefore prefer this color; while conversely the flowers have at the same time become blue because that was the color which the bees prefer. As in most other cases, the adaptation must have gone on *pari passu* on both sides. As the bee-flowers grew bluer, the bees must have grown fonder and fonder of blue; and as they grew fonder of blue, they must have more and more constantly preferred the bluest flowers.

ELECTRICAL PROPERTIES OF INDIUM.—The metal indium has always been a more attractive object for the physicist than for the metallurgist. If it were not for the two brilliant lines in its spectrum, blue and violet respectively, that helped Messrs. Reich and Richter to its discovery, some eighteen years ago, and which are still one of the favorite sights for the audience of a lecture on spectrum analysis, the general public might hardly know anything of its existence. *Engineering* says: It is so scarce, that even its prominent qualities could hardly secure it a future. The royal mines at Freiberg having come into possession of a somewhat larger quantity of indium than usual, they placed some at the disposal of Mr. Th. Erhard, to enable him to make some experiments with a view of ascertaining the electric position of this metal, but great difficulty was caused by the metal being so very soft. To ascertain the conductive resistance in the wire drawn from it, Mr. Erhard rolled it up in a coil, but he found, however, after unrolling and measuring at the termination of his researches that the wire had extended its length one-fifth of an inch, the original length being a little less than six feet. It was ascertained that the electrical resistance of indium was about eleven times less than that of mercury, and that it increased pretty regularly with a rise of temperature.

A NEW PROCESS FOR MANUFACTURING GAS IS OUTLINED AS FOLLOWS:—First, in injecting air and steam into or through incandescent coal or carbon contained in a suitable furnace, causing the air and steam to combine with the carbon, and to produce carbonic oxide and carbonic acid; the hydrogen of the decomposed steam and the nitrogen of the air being at the same time set free. Secondly, in the separation of the nitrogen from the gas by converting it into ammonia, said conversion being effected by causing it to combine with carbon and alkali, so as to form cyanogen, and subsequently decomposing the cyanogen so formed by means of steam, the product being ammonia, the oxides of carbon, and alkali; and subsequently removing the ammonia. Thirdly, in decomposing the carbonic oxide in the gas and converting it into carbonic acid by means of incandescent steam, the product of said decomposition being carbonic acid and hydrogen gas. Fourth, in the removal of the carbonic acid from the gas by means of ammonia.

THE CRICKET'S CHIRP AND THE TEMPERATURE.—The rate of the cricket's chirp varies with the temperature, becoming faster as the latter rises. Recently a writer in the Salem (Mass.) *Gazette* gave the following rule for estimating the temperature of the air by the number of chirps made by crickets per minute: "Take seventy-two as the number of strokes per minute at 60° temperature, and for every four strokes more add 1°; for every four strokes less deduct the same." In a letter to the *Popular Science Monthly*, Margarette W. Brook gives an account of observations she made with a view to testing this rule on twelve evenings, from September 30th to October 17th. Her column of temperatures, as computed by the rate of vibration, shows a close agreement with that of temperatures recorded by the thermometer.—*Nature.*

THE CARBONACEOUS RESIDUE FROM THE SOLUTION OF STEEL IN THE DOUBLE CHLORIDE OF COPPER AND AMMONIUM.—When steel is treated with the double chloride of copper and ammonium, it dissolves and leaves a carbonaceous residue. Mr. Andrew Blair, in a series of experiments, washed this residue with the above double chloride acidulated with hydrochloric acid, and finally with water, until the filtrate gave no precipitate. Then nitrate of silver was added. A careful examination of the substance then revealed the fact that it contained carbon, hydrogen, oxygen and chlorine, besides a small quantity of nitrogen. It appears probable that the carbonaceous substance is not simply a hydrate of carbon, but rather a carbon compound.

AN ELECTRIC LIGHT IN THE STOMACH.—Think of an electric light in your stomach; yet such a contrivance has been put into use lately. A fine platinum wire, rendered white hot at its extremity by an electric current, and this extremity covered by a little glass globe, is the whole machine in a nutshell. The effect is, as it were, to render the body in a manner translucent, enabling the operator to take a panoramic view of one's internal economy. We may now show the degrees of digestibility of all the patents and high grades in the market, and be enabled to sample the brand and consumer at the same time.

THE MOST DANGEROUS POISON.—The late Sir Robert Christison was the discoverer, by an experiment on himself which nearly proved fatal, of the properties of the Calabar bean, and was one of the last pupils of Orfila, the great toxicologist. At the Palmer trial, after testifying that he knew a vegetable alkaloid, the minutest dose of which was fatal, but which no test could detect in the body, he was adjured by the judge not to mention it, though he received hundreds of letters afterwards begging him for "the sake of science" to make the secret known. The poison in question was digitaline.

POSSIBLE SHIFTING OF THE COURSE OF THE LOWER MISSISSIPPI.—For some time a portion of the waters of the Mississippi river have escaped into the Atchafalaya river, a few miles below the mouth of the Red river. At a recent session of the House Committee on the Improvement of the Mississippi river, Capt. John B. Eads laid great stress upon the importance of closing this undesirable outlet, and predicted that if it were not closed the whole volume of the Mississippi would take that route to the sea.

WORK YIELDED BY VARIOUS SUBSTANCES.—In a recent lecture at the Crystal Palace, London, Prof. Sylvanus Thompson explained the theoretic work obtained by the consumption of one ounce of various substances as follows:

1 oz. of hydrogen gives		2,925,000	foot pounds.	
1 " " coal	"	695,000	"	"
1 " " zinc	"	113,000	"	"
1 " " gunpowder	"	100,000	"	"
1 " " copper	"	69,000	"	"

THERE is in course of construction at the Maryaville foundry a machine which is a combined dredger and levee-builder. It is the second of the kind ever built. The first one was made at the same establishment, and is in use on the San Joaquin river. This one is to be used in levee building on the Sacramento river. The dredge has a swing of 80 ft. The machine is capable of building a levee 40 ft. high and 80 ft. wide. It is known as the Vandegar dredger.

THERE is a rumor afloat, says the Austin *Reveille*, to the effect that the company who recently purchased the Alexander mill and mining property at Grantsville, has contracted with a San Francisco party to put in 60 stamps in the mill in addition to the 40 already in use. Another rumor is that 110 more stamps are to be added, which would make 150 altogether.

TOO MANY MEN.—Men are flocking into Bristol. Dick Walsh, Foreman of the Day Company's furnace, informs us that the town is filled with idle men, who can get nothing to do, and he knows of no prospect of them getting anything to do. His advice to people on the outside in search of employment is to keep away from Bristol.—*Pioche Record.*

THE BROOKLYN BRIDGE.—The bridge between New York and Brooklyn will be open for passenger traffic next Christmas. Latest estimates say that the cost of this mammoth structure will amount to over $2,500 per ft., or a total of $14,939,590.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Mar. 23		Week Ending Mar. 30		Week Ending Apr. 6.		Week Ending Apr. 13	
Alpha	1½	80c	80c	55c	50c	35c	75c	45c
Alta	3.15	2.90	3.10	2.15	3.05	2	3.40	2.60
Andes	85c	70c	75c	65c	55c	50c	85c	55c
Albion	3.20	2.95	2.80	2.20	2.90	2.30	2.35	2
Argenta	10c	....	30c	....	10c	....	10c	5c
Addenda	10c	....	15c	10c	15c	....	5c	....
Belcher	60c	50c	55c	45c	50c	45c	45c	40c
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	6⅝	6	6¼	5⅝	5½	4.30	6¼	4.65
Bullion	75c	55c	50c	25c	30c	20c	30c	20c
Bechtel	35c	30c	30c	....	30c	....	25c	....
Belle Isle	....	....	....	....	....	....	....	....
Bodie	1.45	1¼	6	4.65	5⅞	4⅞	5½	5¼
Benton	45c	40c	45c	25c	40c	20c	80c	25c
Bulwer	2.10	2	2¼	....	....	....	2¼	....
Boston	50c	....	50c	....	40c	30c	25c	....
Black Hawk	....	....	15c	10c	10c	....	10c	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	10c	....
Caledonia	....	....	5c	....	....	....	....	....
California	35c	25c	30c	15c	15c	10c	20c	10c
Challenge	....	....	....	....	15c	....	....	....
Chollar	1.20	1.05	1.20	1.05	1.10	65c	1.15	85c
Confidence	80c	60c	75c	60c	55c	....	75c	65c
Con Imperial	10c	5c	5c	....	....	....	....	....
Con Virginia	90c	75c	80c	60c	60c	50c	75c	55c
Crown Point	45c	25c	45c	40c	45c	40c	50c	40c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	15c	....
Concordia	1	....	1.65	1.60	2.60	2¼	2.25	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	35c	30c	30c	....	25c	....
Derbec	....	....	....	....	....	....	....	....
Day	1¼	1.35	1.95	1.40	2.65	1.30	1.90	1.70
E. Mt. Diablo	25c	20c	20c	15c	20c	15c	15c	....
Eureka Con	24	19½	23⅞	21½	23⅞	20	22½	21½
Exchequer	45c	40c	35c	25c	25c	15c	30c	20c
Eadowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	25c	....	50c	30c	45c	35c	40c	35c
Gould & Curry	3.55	3.0	3.20	3	3.35	1.95	3.45	2¼
Hale & Norcross	1.20	1.05	1.05	90c	90c	60c	1.40	75c
Head Center	....	....	....	....	25c	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	15c	10c	10c	....	15c	10c	....	....
Justice	70c	55c	60c	50c	55c	40c	1.05	45c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	25c	20c	30c	25c	25c	20c	....	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	5c	....	....	....	....	....	....	....
Levisthan	....	....	....	....	....	....	....	....
Leeds	45c	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1⅞	....	1⅞	....	1¼	....	....	....
Martin White	6¾	5⅝	8	7⅛	7¼	....	4	3¼
McClinton	....	....	....	....	....	....	....	....
Meno	1¾	1⅛	3.40	1.85	2	1.65	1⅞	1.45
Mexican	8⅝	7⅛	7⅞	6¾	8¼	4.65	9	5
Mt. Diablo	6	5⅛	6¼	4⅜	5	3⅛	4⅜	4.55
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	1½	90c	1.70	1.40	1.45	1	1.20	1
New York	....	....	5c	....	....	....	....	....
Northern Belle	9	8¼	8¾	....	8	7⅞	8¼	8¼
North Noonday	1¼	70c	1⅞	1.45	1.35	85c	....	....
Navajo	35c	30c	1	45c	80c	65c	95c	90c
Occidental	75c	....	80c	....	80c	70c	1	80c
Ophir	3.65	3.10	3.05	2.80	2.60	1.90	6	3.05
Original Keystone	....	....	....	....	....	....	....	....
Overman	35c	30c	30c	25c	25c	15c	30c	20c
Oro	40c	30c	65c	45c	50c	40c	50c	30c
Paris	....	....	1	50c	....	....	....	....
Potosi	1.15	95c	1	90c	90c	55c	1	75c
Queen Bee	....	....	5c	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.20	90c	95c	80c	90c	55c	....	1.20
Seg Belcher	2¼	1.85	1¼	....	1¼	1¼	1½	....
Sierra Nevada	7⅛	7	6⅞	6½	6½	5	9¼	5⅜
Silver Hill	15c	....	15c	....	15c	10c	20c	10c
Silver King	17½	17½	17½	17	16	17	16	16¾
Sucoro	....	....	....	....	....	....	....	....
Summit	....	....	25c	10c	20c	....	10c	....
Scorpion	90c	70c	75c	65c	65c	45c	75c	70c
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	20c	....	40c	20c	35c	30c	30c	....
Tioga Con	25c	20c	40c	25c	25c	25c	20c	....
Tiptop	4.60	....	4½	4	4	3½	3.60	2.80
Tuscarora	....	....	....	....	....	....	....	....
Union Con	11⅞	10	10⅝	9⅝	9¼	8	17¼	7⅞
Utah	4.65	3.80	4	3.70	3.70	2.60	6¼	3.15
Ward	3½	....	3¾	....	3¾	....	3¾	....
Wales	60c	55c	60c	50c	60c	....	60c	55c
Yellow Jacket	1.05	1	1.10	95c	1	90c	1 15	95c

Sales at S. F. Stock Exchange.

Thursday A.M., Apr. 13

140 Alpha.....75c
2190 Alta.....3.30@3.40
100 Andes.....85@80c
280 B & Belcher.....6½@6¾
70 Belcher.....45c
400 Bullion.....25@2·c
1380 Benton.....20@25c
300 California.....20@15c
70 Con Virginia.....70c
260 Chollar.....1.05
300 Exchequer.....25c
405 Gould & Curry.....3¼
1740 Hale & Nor.....1.40@1.30
1100 Justice.....90c
1205 Mexican.....8¾@9
485 Ophir.....4.80@4.65
250 Overman.....30c
605 Potosi.....85@80c
280 Savage.....2@1.95
1200 Sierra Nevada.....8¾@7⅞
950 Silver Hill.....15@20c
1225 Scorpion.....1@1.05
3715 Union.....14@15
210 Utah.....5¾@5⅝
320 Yellow Jacket.....1.10

AFTERNOON SESSION.

100 Atlas.....3.15
950 Argenta.....5c
100 Albion.....2@2.05
100 Addenda.....5c
200 B O'Neill.....1½
160 Bodie.....5¾
50 Bulwer.....2
750 Black Hawk.....10c
180 Concordia.....1.70@1¾
25 Day.....1.90
100 Goodshaw.....35c
20 Mt Diablo.....4.60
716 M White.....4¼
100 Northern Belle.....8
500 Noonday.....1.20@1.10
700 N Belle Is.....20c
100 N Noonday.....1
550 Oro.....30c
340 Pinal.....2½
400 Star.....10c
120 Southern Key.....6
100 Silver King.....17
140 Tioga Con.....25@20c
170 Tiptop.....4

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Ophir, April 9th, $10,059; Contention (for March), $170,000; Grand Central (for March), $115,000; Tombstone (for March), $115,000; Tombstone, 7th, $6,020; Girard, 7th. $4,201; Horn Silver, 5th, $15,000; Barbee & Walker, 5th, $2,438; Ontario (for March), $213 000; Hanauer, 6th, $2,050; Germania, 6th, $5,070; Horn Silver, $25,000; Bullionville, 8th, $29,282; Northern Belle (March), $67,308; Noonday (March), $16,316; North Noonday (March), $20,000; Northern Belle, 3d, $8,461; Mt. Diablo, (March 28th, $8,435; Silver King, 31st, $23,015; Syndicate, 31st, $8,500; Standard, 31st, $42,552; Contention Con., April 6th, $12,061; Eureka Con., 5th, $23,902; Bodie Tunnel, 11th, $3,100; Contention, 8th, $17,322; Mt. Diablo, 8th, $8,000.

LEPLAY, the celebrated engineer and scientific writer is dead.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Albion Con M Co	Nevada	10	30 Mar 6	Apr 10	May 2	D B Chisholm	327 Pine st
Alpha Con M Co	Nevada	15	50 Mar 20	Apr 26	May 19	Wm Willis	309 Montgomery st
Belmont M Co	Nevada	31	15 Mar 11	Apr 17	May 15	J W Pew	310 Pine st
Belvidere M Co	California	13	25 Feb 9	Apr 12	May 1	C V D Hubbard	310 Pine st
Benton Con M Co	Nevada	7	25 Mar 10	Apr 14	May 4	Wm H Watson	302 Montgomery st
Best & Belcher M Co	Nevada	23	50 Apr 5	May 11	June 2	Wm Willis	309 Montgomery st
Bullion M Co	Nevada	23	30 Mar 23	May 2	May 24	J M Brazell	323 Montgomery st
California M Co	Nevada	3	20 Mar 29	May 6	June 3	G P Gordon	309 Montgomery st
Fall Creek M Co	California	5	30 Feb 16	Mar 24	Apr 19	W Willis	309 Montgomery st
Goodshaw M Co	California	10	10 Mar 21	Apr 22	May 11	C C Harvey	309 Montgomery st
Hale & Norcross S M Co	Nevada	73	50 Mar 14	Apr 19	May 10	J F Lightner	309 Montgomery st
Independence M Co	Nevada	9	15 Feb 24	Mar 31	Apr 24	E M Hall	327 Pine st
Iowa M Co	Nevada	16	03 Mar 8	Apr 15	May 6	C C Leavitt	411½ California st
Mayflower Gray M Co	California	15	10 Mar 7	Apr 11	May 3	J Morizio	328 Montgomery st
McMillen M Co	Arizona	4	30 Feb 8	Mar 14	Apr 12	J Morizio	328 Montgomery st
Mexican G M Co	Nevada	18	1 00 Mar 13	Apr 15	May 9	C L McCoy	309 Montgomery st
Modoc Con M Co	California	10	30 Feb 14	Mar 28	Apr 25	J W Pew	310 Pine st
Niagara G & S M Co	Nevada	6	20 Apr 1	May 3	May 25	O C Miller	409 Montgomery st
North Gould & Curry G & S M Co	Nevada	2	20 Mar 18	Apr 19	May 11	C H Mason	331 Montgomery st
Ophir S M Co	Nevada	41	1 00 Mar 7	Apr 8	May 2	C L McCoy	309 Montgomery st
Pinal Con M Co	Arizona	3	30 Apr 3	May 8	May 29	W W Traylor	309 Montgomery st
San Jose M Co	Nevada	18	75 Jan 30	Mar 15	Apr 19	A Carrigan	109 Front st
Savage M Co	Nevada	50	50 Mar 7	Apr 10	May 1	E B Holmes	309 Montgomery st
Scorpion S M Co	Nevada	11	10 Mar 9	Apr 13	May 4	G R Spinney	310 Pine st
Sierra Nevada S M Co	Nevada	72	1 00 Mar 23	Apr 26	May 15	E L Parker	309 Montgomery st
Silver Lick Con M Co	Nevada	1	05 Mar 28	May 6	May 27	L J O'Farrell	Montgomery Block
Silver Belt M Co	Arizona	1	15 Mar 8	Apr 17	May 15	J W Pew	310 Pine st
Tellurium G & S M Co	California	26	10 Apr 1	May 8	May 24	H P Bush	431 California st
Union Con S M Co	Nevada	19	1 00 Mar 21	Apr 25	May 15	J M Buffington	309 Montgomery st
Utah S M Co	Nevada	38	1 00 Mar 11	Apr 14	May 3	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Bay State S M Co	Nevada	1	02 Dec 29	Mar 31	Apr 24	J W Pew	310 Pine st
Caborca M Co	Mexico	5	30 Feb 25	Mar 29	Apr 17	W L Elliott	220 Sansome st
Equator M Co	——	—	20 Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Metallic M Co	——	—	20 Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Metallic-Equator M Co	——	—	20 Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
San Pedro G & S M Co	California	4	03 Feb 27	Apr 3	Apr 27	W G Holmes rm 1, Sherman's build'g	
Wide Awake P & M Co	Arizona	16	10 Mar 17	Apr 29	May 25	C Hilderbrandte cor Bush & Kearny	

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Maryland Con M Co	——	E P Farnsworth	219 Sansome st	Annual	May 6
McElroy G M Co	California	Lewis Lillie	607 Washington st	Special	Apr 17
Republic M Co	——	Wm J Taylor	310 Pine st	Annual	Apr 18
Sigourney G & S M Co	——	A Judson	320 Sansome st	Special	April 15

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Apr 12
Contention M Co	——	D C Bates	309 Montgomery st	25	Feb 28
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	60	Apr 11
Silver King M Co	Arizona	J Nash	315 California st	25	Apr 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Apr 12

The Mining Share Market.

Our stock tables show how little change has occurred in prices this week:

In the old bonanza mines they will soon he in shape to do some prospecting along the Best and Belcher line and in other sections. In this part of the Comstock there is a vast amount of unexplored ground. For a long time they have been almost wholly occupied in making air and and other connections.

At the Savage they are now pushing prospecting drifts on both the 2200 and 2400 levels, and in both they will soon reach the vein. Meanwhile they are taking out and milling a considerable amount of ore from the old upper levels.

In the Chollar and Potosi they are exploring a large section of wholly virgin gronnd, lying on and above the 2400 level. Some very favorable material is being encountered in the crosscuts now in progress.

At the Yellow Jacket and other mines that are flooded no work is being done at present, but plans for pumping ont the water are being drawn up. It is quite probable that the Belcher pump will he moved np to the Ward shaft and set to work at that point. It is the belief among those best informed, that the water will not hold out long after a determined attack is is made npon it. It is thonght that in filling np the levels of the several mines it bas about spent its force.

At last measnrement the water had risen 380 ft. above the Yellow Jacket 2300 station, and was thought to he still coming np slowly, thongh with so little strength that this may he given as the prohable point above which it will not rise materially. The committee are at work on their plan for draining the Yellow Jacket and surronnding mines.

A Enreka dispatch says: "Upon examination of the ground around the ore body in dispute, between the Richmond and Alhion, it was found to have caved hadly, and it is estimated that it will cost $25 a ton to take it out."

Assessments falling delinquent in April amount to $856,100, levied hy 27 mines, against $1,068,450, levied hy 39 mines in April, 1881, including $885,450 for Nevada, $128,000 for California, $30,000 for Idaho and $25,000 for Dakota. Of this month's delinquent assessments, Nevada mines want $791,100, California $21,000, Utah $18,000 and Arizona $26 000. The comparative statement of the assessments falling delinquent during the first four months of 1881 and 1882 are as follows:

	1881.	1882.
Nevada	$2,287,350	$2,068,800
California	630,900	436,600
Idaho	30,000	
Dakota	100,000	50,000
Arizona	78,000	118,000
Utah	9,000	22,000
Mexico	17,500	30,000
Totals	$152,750	$2664,800

THE Visalia *Delta* saya the public schools of Tnlare county have been carried on under great disadvantages, this winter, owing to the general prevalence of measles and whooping-cough, and the tendency of every had cold to develop into pneumonia. There are few districts where the teacher has not been obliged to suspend operations two weeks, four weeks, six weeks, and so on.

Discovery of Iron.

The Calaveras *Citizen* of the 8th, says: While in Sheep Ranch on Monday we learned of an important discovery—the discovery of a lode of rich iron ore. As the discoverers and locators are all residents of Sheep Ranch, we had no difficulty in ascertaining the particulars in regard to the mine. From them and others we learn the following: The lode, which oddly enough, was discovered on the first day of April, is situated two miles east of Jesns Maria creek, and crosses this creek about 400 ft. east of the Livermore Mining company's quartz mill. It extends north and sonth, and can he traced two or three miles, hut the discoverers believe that only 700 or 800 ft. of the vein is of high-grade ore. Assays have been made of ore taken from various parts of the lode, some of which yield as high as 90% iron. The average width of the lode, judging from the croppings, is about 300 ft. and is of high-grade ore throughout its entire width. The ore is called magnet iron ore, for the reason that small particles will readily adhere to a magnet. This same lode has been prospected south of the place the present location was made. The present locators were not the first to discover the lode, hut they were the first to discover the particular spot on the vein where the high-grade ore is obtained. The lode was discovered by J. H. Bray and W. B. Swank, and on April 1st it was located hy J. H. Bray, W. B. Swank and J. S. Swank, and the name appropriately given is the "Iron King."

THE SMALLEST CIRCULAR SAW in practical nse is a tiny disk about the size of a five cent nickel, which is employed for cutting the slits in gold pens. They are about as thick as ordinary paper, and revolve some 4,000 times per minute. Their high velocity keeps them rigid, notwithstanding their extreme thinness.

THE Union Pacific Railroad Co. employs about 25 traveling agents, besides an army of general agents, to give information ahont transortation and facts regarding the great West.

Meetings and Elections.

Teirakoff Con. G. M. Co., April 10. Trustees—A. W. Bishop (President), Stephen Wing (Vice-President), A. G. Gurnett (Treasurer), W. G. Gurnett (Secretary), J. C. Gore, William Antisell, H. W. Clays. Work will be resumed on this property immediately.

Bullion Con. M. Co., April 10. Trustees—Daniel Cook (President), Charles H. Fish (resident Vice-President), John F. Boyd, W. S. Wood, William Willis, L. Osborn (of San Francisco), and M. R. Cook (of New York), Vice-President.

Excelsior Water & M. Co., April 5. Trustees—J. H. Bolles, Henry W. Cleveland, H. B. Wheaton, William B. Carr and Joseph Clark. Mr. Bolles was elected President.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

Hite Con. M. Co., April 10. Location, Hite's Core mining district, Mariposa county. Directors, T. J. Fitzpatrick, N. R. Hart, L. H. Pockman, R. E. Dondall and J. P. Heaney. Capital stock, $20,000,000, in 200.000 shares.

California Volcanic Water Co., April 10. Object—To purchase and locate real estate lands containing volcanic waters and mineral springs. Directors, C. A. Miller, H. Fahrenkrug, F. W. Vogelin, M. Fitzpatrick, C. Kelpe, J. T. Smith, H. Lackmann, L. Husrstel and F Runtscher. Capital stock, $5,000,000

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

BULLION.—Monitor *Argus*, April 3: Isabelle G. & S. M. Co. shipped to San Francisco on last Friday five bars of hullion from the Stella mine.

ORION.—We learn from P. Onriz that it is the intention of the Orion G. & S. M. Co., of Stockton, Cal., to more fully develop the Mullen mine, of Mogul, by sinking the present two-compartment shaft to the depth of 100 ft, and drift to the ledge at that depth. The Orion Co.'s property consists of two locations, each one being 1,500 ft in length, and joining the famous Stella mine on the east; also, one location running east and west along the ridge, and connecting with the old Mullen locations, above mentioned, on the west. The history of this property is identical with many other valuable mining properties in this county, which were located during the mining excitement of 1863-64, and abandoned, the ore being considered of such a base character that it could not he reduced at a profit. A prospect tunnel was run, in 1863, across the hill. The ledge was struck 80 ft from the mouth of the tunnel, and 40 ft in depth from the surface. Ore of a rich character was discovered, and a number of tons were hauled to the quartz mill in this place, and battery assays showed $60 per ton in gold and silver; yet the milling only gave $18 per ton in gold and silver. Milling, those days, was expensive, and the owners of the mine, not knowing a process of working its ores successfully, lost money on the experiment, and the mine was abandoned and pronounced worthless. Knowing that other ores of this same character are now being worked successfully at a small cost, there is no reason to doubt that, should the Orion Co. find the ore in the 100 ft deeper than the present workings they will have one of the richest mining properties in the State.

AMADOR.

THE KELLY MINE.—Amador *Sentinel*, April 6: Through the politeness of the superintendent, W. F. Walton, we were permitted to make a thorough inspection of the Kelly mine. This mine is now owned and worked by a Boston company, who purchased it from Owen Kelly, some months ago. The mine is on Murphy's ridge, two miles south of Jackson. The ground held by the company comprises two locations of 1,500 ft each—the McKay & Love and the Kelly, the latter of which is now being worked. A tunnel has been run nearly north into the ridge a distance of 715 ft, and on the face of the tunnel the ledge is 8 ft wide, having an average width in the tunnel of 5 ft. The first crosscut is run to the west, 280 ft from the mouth of the tunnel. It has been run 161 ft. At 106 ft from the tunnel it cuts the ledge, which is 5 ft in width. The second crosscut is run in the same direction, starting within a few ft of the end of the tunnel. It cuts the same ledge found in the first crosscut 49 ft from the tunnel. This crosscut is in 105 ft, and is being run to connect with the shaft of ledge. The ore found in the tunnel is ribbon-rock, and contains a fair proportion of sulphurets, which assays $80 per ton. The shaft is now down 115 ft, and will have to be sunk about 140 ft farther in order to connect with the second crosscut from the tunnel. The ledge is 4 ft wide in the bottom, and is good-looking rock. Nearly 1,000 tons of ore are on the mine dump, and a considerable quantity of rock is on the tunnel dump. Ore can be taken from five different points in the tunnel and crosscuts. This mine can be worked very cheaply, as there appears to be rock enough above the roof of the tunnel to run the mill for several years. The ore car can be run under the chutes, filled and run out. The mill is the one formerly in use at the Montecristo mine—20 stamps, 750 pounds each—and has been erected by the veteran mill-builder, S. Brees, who is now giving the finishing touches. The mill has a capacity of running through 60 tons every 24 hours, and will be set to work, giving one of "Brees' tests," so soon as the shaft ledge is struck in the crosscut, which will be in a few days. A broom bundle will ho used to save the sulphurets. T. B. Earhart has charge of the underground work at the mine.

VOLCANO TUNNEL.—Amador *Ledger*, April 8: The Volcano Tuunel company are ruuning through immense quantities of gravel, which has every indication of being very rich. The vast body of water carries everything through the flume. Bowlders as much as a man could lift are washed through like playthings. As the blocks are of wood, although unusually stout, the passage of these howlders and debris wears them out rapidly. Some apprehension is felt ou this score. It is prohahle that before another season the wooden blocks will have to he replaced with iron riffles, to avoid troubls in the direction indicated.

DOWNS.—This mine continues to turn out handsomely the precious metal. The pitch of the ledge to the northeast necessitates the sinking of a new shaft, as every sinking in the present shaft carries them farther from the ore-body, requiring additional length of tunneling to reach the ledge, and lots of dead-work in running the cars to and from the shaft. The only remedy is a new shaft that will strike the ledge somewhere about 500 ft deep.

CALAVERAS.

GOING TO START.—*Mountain Echo*, April 5: J. C. Scribner, who has the management of the Jones mine, says that work will he resumed in about two weeks, or as soon as the weather settles. This is encouraging, for no doubt hut that the Jones mine is rich, if properly developed.

ASSAY.—John Meyers, owner of the Excelsior mine, near this place, sent three lots of quartz, taken from his claim, to Vulcare, Arizona, for the purpose of getting a correct test of the ore. Assays were made, with the following results: First lot, $89 per ton; second, $42; third, $200.

GOOD PROSPECT.—The proprietor of the Uno mine tells us that he crushed 30 lbs of ore taken from the mine at a depth of 2½ ft, which yielded about $1, or in the neighborhood of $70 per ton. As soon as the mortar is readjusted, work will be commenced on an extensive scale.

NOTES.—Oshorn & Co. are still running their hydraulic, and are washing the surface off the Gold Hill quartz mine. The ground sluice prospects well, and a big clean-up may be expected. One of the company has been doing some work in the quartz, which has proved very satisfactory. He collected a pan of ore and crushed it in a mortar, and it yielded the neat little sum of $60. The Rasherry Bros. are making preparations to sink a shaft on their mine. They are down now about 10 ft. The vein is from 12 to 15 inches in width, and the average yield of the ore by the arastraing process is about $12 per ton. It is the intention of J. T. Fletcher & Co., to sink a shaft on the south end of the Confidence mine. The mine has been thoroughly tested, and it is a well-known fact that the ore is of a high grade. Mr. Fletcher has the money and the energy to carry it through.

EL DORADO.

GRIZZLY FLAT.—Cor. El Dorado *Republican*, April 6: The Mount Pleasant has got started for a long run, on good rock. The Mount Pleasant, to this camp, is the same as Standard to Bodie, or Idaho to Grass Valley. All mining camps have their best mine. I am satisfied that depth will develop some good mines. On the 400-level of the Mount Pleasant they have a vein from 2 to 12 ft thick; in the face of the drift it is a perfect glitter of sulphurets. I have seen a great many good mines, but this one is the best I have ever seen. We all expect a boom here this summer. All the miners are prospecting. All we want is money, pluck and energy, to make this a big camp. I had a talk with an old settler, who has been here for 30 years; he says the prospects have never been so flattering as they are now. I hear some talk of the Arctic starting up. They have a good property. Times are very lively at the Drieshach mines. We are all in hopes they will get two good mines there. There was some very rich

rock taken from those mines in the early days. The Treat will resume work as soon as they can get machinery on the ground. Mr. Spencer is in town, and as soon as the snow goes off will commence crushing rock from the Grouse gulch mine. The old Eagle is shut down. What a pity it don't change hands. The old company is always trying to find the mine on top of the ground, and all the experts here think it is down below. Mr. A. H. McAfee owns the south extension of the Mount Pleasant, and calls it the Ohio. He has done some work on it. It is a valuable location. The Gallagher drift gravel mine has been running all winter, and have got out considerable dirt. Major W. H. Houghton and some other Sacramento parties own the Hattie mine. They have sunk a good shaft on it, 50 ft deep. I am told the rock assays up high, from $180 to $330. Mr. Jeffries owns the Cousin Jack, at Henry's Diggings, and has done considerable work on it, and it looks well.

A Good Prospect.—*Mountain Democrat*, April 8: On Wednesday evening last we were shown a specimen of quartz and some quartz gold, the result of that day's prospecting on a ledge now being opened up by Messrs. Duncan, Johnson and Gray, on Poverty Point, near this city. There is every indication that they have a good ledge, and we shall have more to say about it from time to time as it is developed. It is an extension of the old "shepperd sandstone ledge," which is traceable for more than ten miles, and which yields a fair prospect at almost any point.

The Æna Mine.—Friend Kohlert was down from Fairplay on Monday and Tuesday of this week, and exhibited some remarkable sulphurets, taken from the Æna mine, located about 6 miles from Fairplay. The vein matter, on which the mill is now steadily running, pays upwards of $40 per ton.

INYO.

To Work Tailings.—A company, consisting of Messrs. Ward, Thorpe, Clinton and Todd, has taken hold of an enterprise on Kearsarge mountain, for which the best results is to be hoped. They will refit the old Pioneer mill, in the old town of Kearsarge, for the purpose of working the tailings at the reservoirs of the Kearsarge mill. In pay for them, the enterprising workers have contracted to sink a 50-ft shaft in the lower tunnel of the Kearsarge mine.

Panamint.—The Inyo Con. Co., at Panamint, is reported to have out some 500 tons of ore, assaying from $250 to $500 per ton. The work of extracting ore is constantly going on, but the mill will probably not steam up before the 1st of June.

A New One.—Mr. Melinda, one of the Mexicans prospecting in Beveridge, last week found a rich gold ledge at a point north of the Keynot, near Taylor's canyon.

The Keynot.—From William Ritchie, who has been working in the Keynot mine, we obtain a good report of the present condition of that solid and reliable gold-producer. He says that Supt. Miranda is working 28 or 30 men in all, including packers, surface men, etc. About 350 ft of the face of the ledge has been opened for taking out ore or tunneling. Stoping is going on in a 4-ft body of fine ore. The winze in the lower level is all in rich ore.

To Start.—The Keeler City mill, it is reported, will start up in 3 or 4 days, on Palma ore, under the general management of the lessee, Supt. Wheeler. Capt. Keeler is engaged in repairing the Cottonwood flume, and is making extensive preparations for getting out timbers, wood and coal. He intends fitting up a steamer, probably the old *Bessie Brady*, for transporting such supplies across the lake.

The Freeborn Canyon Mill.—Taylor, McEvoy & Co.'s 5-stamp mill, in Beveridge district, made a clean-up during the past week. In 20 running days it crushed 192 tons of Keynot ore, which yielded close on to $11,000, in gold. In some 4 or 5 days Supt. McEvoy will start up the mill again, on a lot of about 100 tons from the Losano mine, which is situated about 1 mile south of the Keynot.

NEVADA.

Buelow.—*Herald*, April 4: Only two men are now working in the Buelow mine, near Newtown. Some time last year the mine was hooded to a company, and a tunnel run into the hill a distance of over 400 ft. Recently the company ceased work. The ledge was tapped when the tunnel had been run 350 ft, and crosscuts were then made to determine the extent of the vein. We were yesterday shown some specimens of rock taken from the face of the tunnel, at a perpendicular depth of about 125 ft from the surface. The quartz presents well in rich-looking sulphurets, and the general character of the ore is good. The ledge is 3 ft wide and in slate formation, with a thickly sulphureted selvedge. There are two ledges on the Buelow property. On the upper one, known as the Buelow Consolidated, a shaft was sunk 142 ft, when a "horse" was encountered. The ledge in the shaft was about 2 ft wide, and rock taken from it assayed as high as $202 per ton. By mill process, without the sulphurets, $28 per ton in free gold was obtained. No work has been done on the upper ledge for about a year. We understand arrangements will soon be made to resume work at this mine on a more extensive scale.

Wide West.—There are 50 tons of quartz on the dump of the Wide West mine, at Canada Hill, which will be hauled to Crosby's mill for crushing, in a few days. As soon as the rock is taken away, the present hoisting works will be torn down, and new works erected over the new incline now being sunk, about 30 ft from the old one. The new shaft is down 60 ft, in the bottom of which there is a foot ledge, of good-paying quartz. The owners of the Wide West feel very sanguine over their prospects.

PLUMAS.

The District.—Greenville *Bulletin*, March 20: Items of interest to the mining community have been few during the prevalence of the late storms. The operations of so many mines being dependent on the water supply, the condition of the Round valley reservoir becomes a subject of deep concern. Since the storm passed, water is making rapidly; the snow is now fully saturated, and in a day or two water will be flowing into the lake much faster than it can be used. In less than a week the ditch will be carrying a full head of water. The extensive improvements being made on the reservoir by the water company are now far toward completion. The embankment is raised nearly 3 ft, and will be continued till that hight is gained. It is cribbed and strengthened in the most solid manner. The supply-pipe has been extended into the lake, beyond the new portion of the embankment, and a water-gate put in, so that the water can be shut off, and any needed repairs made to the pipe, within or below the dam. This is a very important improvement, and one that was much wanted. Formerly the water could only be shut off below the dam, and had any repairs been necessary the reservoir must have been emptied to do the work.

Cherokee.—The Cherokee company's mill has been able to run about 10 stamps for a few days during the month. After the first of the month they will be able to make full time with the entire battery. The new plank road from the mine to the mill is now opened and ore-hauling commenced. The mine continues to open out good ore.

Green Mountain.—The mills of the Green Mountain company had just started up, with about 35 stamps running, when the storm blocked the ditch, and compelled them to hang up again. They will have plenty of water to start up once more by Saturday.

Southern Eureka.—At the Southern Eureka mine the roads have been blocked with snow, so that no ore could be hauled to the mill, compelling them to hang up their stamps for some days. On Saturday morning the mill was started up again, and is now running as usual. Some very rich ore has lately been struck in this mine.

Indian Valley.—The Indian Valley company's mill started up on Saturday afternoon, and is now running at its full capacity. The hoisting works were not stopped at any time during the storm, and work in the mine went on as usual. This company will soon use water power for working their mill.

Cook's Canton.—The water has now started to run in Cook's canyon, and gravel mining will begin there in a few days. There is more snow on the slopes of the mountains around the canyons in that section than has been seen in 15 years.

Light's Canyon.—Last fall mention was made of a ledge having been found by Morton and Jackson in Light's canyon. When placer mining stopped for the season they went steadily to work on the ledge, and have continued all through the winter, until at the present time a very promising vein of gold quartz is opened up.

Rich Silver and Iron Ores.—It is commonly believed that there is no silver ore in this district, but like many other common beliefs, this turns out to be an error. Some weeks ago, specimens of what was thought to be silver ore, were sent to a perfectly reliable authority for assay. A report has just been had from the assay that one of the specimens sent contains 54 ounces of silver. A trace of gold was also found in the ore. Along with the silver ore some specimens of iron ore were also sent. This the same authority pronounced to be specular iron ore of the finest quality; and says, further, that if facilities for working it are found near the ore, we have all the essentials of a great iron industry. The immense value and variety of the resources of Plumas county are only beginning to be understood.

SHASTA.

Eagle Creek.—Cor. Shasta *Courier*, April 8: The mining interests (the placer mines) are hardly worth mentioning, as there are but very few around here, and what there are pay poorly. Quartz is receiving particular attention. There are more men at Sunny Hill this spring than there has been at any previous time. Peck & Dutton are taking out good rock and making preparations for starting their arastra. Mr. Frank Ballou is taking out plenty of rich rock from the Flower of Sunoy Hill. He is building a new trail to haul his rock over. He intends to start his arastra before long. Mr. Jacob Murray, one of our merchants, owns the mine known as the Lost Buck. He is having a large double-bed arastra constructed; also has a crew of men digging a ditch to bring water around to run the arastra. There are several other parties prospecting, but have not as yet developed anything to justify them in putting up any sort of a mill. The most of them, however, feel confident of success.

SIERRA.

Flattering Prospects.—Sierra *Tribune*, April 6: The St. Louis mining company, who are operating between Gibsonville and La Porte, recently struck blue bed-rock, and a very good prospect in blue gravel, although not as yet in paying quantities. They are still pushing their tunnel ahead, and with a very flattering outlook.

Work to be Resumed at the Lafayette.—Supt. T. H. Smith says work will be resumed at the Lafayette Hill gravel claim as soon as the roads will permit of getting in the necessary supplies. One of the members of the company is expected out from New York in a short time.

TUOLUMNE.

Another Big Enterprise.—*Independent*, April 8: Mr. J. G. Divoll, who has taken out so much money from the Bonanza mine, in Sonora, is opening up a large gravel property 2 miles in length, situated between Jacksonville and Steven's Bar. The gravel is near the combination of claims owned by him, known as the Yosemite and Grand Rapid quartz claims, on the mother lode—both valuable properties. The gravel which has been discovered is a river channel, formerly the course of the Tuolumne river, and never having been interfered with by the honest miners. A ditch has been surveyed to bring free water to the mines—the source being the Tuolumne river, which carries water enough the year round to furnish all the mining properties in the State with abundance. The water will also be utilized for mining machinery to the proposed quartz mill, which will be furnished with not less than 50 to 100 stamps. Mr. Divoll assures us that the project will be carried through; he has the coin to do it—and it is well known that when he starts into a project in earnest he has never failed. He has spent several months with a force of men prospecting and making preliminary arrangements to carry the project to a successful termination, and is now thoroughly convinced that this enterprise will turn out a second Bonanza, and even far exceed his former, and prove to be a lasting one for years to come.

NEVADA.

WASHOE DISTRICT.

Sierra Nevada.—*Enterprise*, April 9: On the 2700 level main north drift No. 1 has been extended 27 ft, and main north drift No. 3 has been extended 15 ft. The joint Union Con. east winze has been sunk 10 ft.

Union Con.—On the 2700 level east crosscut No. 1 has been extended 22 ft. The joint Sierra Nevada east winze has been sunk 10 ft. In the main lateral drift are engaged in casing timbers. On the 2500 level are stoping out ore. The engine and cage are in place at No. 1 winze, and the 2600 north drift started. During the week 486 tons of ore were extracted, and 684 tons and 1,070 lbs. have been sent to the mills.

Union Shaft.—Are putting in a pump bob at the 2,600 station and repairing the drift to the Mexican winze.

Utah.—Timbering and repairing at the head of the incline.

California.—On the 2700 level the main south lateral drift bolo has been extended 205 ft, and joint Con. Virginia east drift No. 2 has been advanced 31 ft.

Con. Virginia.—On the 2700 level joint California drift No. 2 has been advanced 31 ft.

Mexican.—On 2700 level the main north lateral drift has been extended 20 ft, the main south lateral drift the same.

Ophir.—During the week bullion to the value of $10,059.85 has been shipped.

Alta.—During the past week the north lateral drift, 2150 level, was extended 18 ft, and the south lateral drift 24 ft. Both drifts are in hard porphyry outside the vein, where we occasionally cut stringers of fair ore.

Yellow Jacket.—The water to-day stands 370 ft above the 2300 station, having risen 3 ft during the past 24 hours.

BRISTOL DISTRICT.

The Mill.—*Times*, April 4: At the Bristol mill everything is running along smoothly as usual. Are now roasting the ore again on account of it being a little more base than formerly. A large amount of good rock is daily coming down, and the bullion output for March will foot up to a good figure. The company has let a contract to put the well down another 100 ft, and when done a water necessary will be obtained for running the mill. The Day mine has probably the longest and the crookedest smoke stack in the United States. It is 471 ft long with 27 different twists and turns, running through all the upper drifts and levels from the hoisting machinery in the tunnel to the surface. How is that for a stack, and where is its equal? Heavy hoisting machinery is to be put upon the Pay Day, with a sinking capacity of 1,000 ft.

COLUMBUS DISTRICT.

Northern Belle.—*True Fissure*, April 8: A set of station chairs has been put in the shaft at the new station on the 5th level. The adit and the levels above present about the same appearance as last week and continue the usual production of ore. Sixty tons of ore are being extracted daily and sent to the mills, both of which are running steadily and doing the regular amount of work. A shipment of bullion amounting to $6,558.62 was made on the 6th inst. The total shipments of bullion on March account aggregate $67,308 85.

Mount Diablo.—The stope above the east drift on the 3d level shows a larger body of ore than at time of last report, and the prospect at this point is encouraging. Near winze No. 1, on this level, a ledge of high-grade ore is being worked that looks very promising. The stope near the center of the mine, below the second level, continues to open well and the outlook at this place is very good. The stope east of the shaft has been discontinued, the ore as found being of a very poor quality. Shipments of bullion were made on the first instant amounting to $8,435.43; and on the 4th instant amounting to $8,988 25. The total production for the month of March was $68,845.46.

East Mount Diablo.—The north crosscut is in 27 ft, the face being in favorable working ground, which is improving each day. A crossent has been started south and a turntable put in at the point of intersection with the drift.

Gen. Jackson.—The work of extracting ore still continues, the output being equal to that of any previous week. A deposit of first-class ore was struck recently and appearances would indicate its opening well.

CRABB DISTRICT.

Free Milling.—Esmeralda *Herald*, April 8: Without doubt this new field for the prospector and capitalist will receive its share of attention this summer. The ore of the district is free milling, mostly gold, and from samples assayed is shown to be very rich. Here is an assay of a sample taken from near the surface of one of the claims there recently: Del Monte assay office, March 25, 1882. Sample of ore deposited by M. M. Glenn gold $728.51; silver, $3.77; total, $727.38.

ESMERALDA DISTRICT.

The Cortez Mine.—Esmeralda *Herald*, April 8: Capt. Eudey, who for two weeks has been making an examination of the Cortez mine, left for San Francisco last Thursday. Before going he called at the *Herald* office to bid us good-bye. He said he had made a thorough examination of every portion of the property, estimated the amount of ore and taken samples of the same and forwarded them to the home office of the company in New York, and would take with him to San Francisco duplicate samples to be assayed there. He expressed a belief that the company would start work again on the mine, but could say nothing definite until returns were received from the samples sent them. Capt. Eudey says also that in his last examination he is more pleased with the mine than before. Should the company decide to resume work, it will probably be a month or 6 weeks before anything will be done.

LEWIS DISTRICT.

The Starr-Grove Attachro.—Lewis *Herald*, April 5: The Starr-Grove mine, offices and other buildings, were attached Friday evening by J. Hill for the sum of $7,784. The company has not paid off for two months. A great many miners have been thrown out of employment; most of those who were working at the mine have families, and many have just built themselves dwelling houses, while some have lately brought their families from distant points. If they should not be able to recover their wages it will entail great hardship among them.

The Betty O'Neal.—The Betty O'Neal mine is still turning out the usual amount of ore—between 6 and 7 tons per day. The south drift still improves. A stope is being opened up on this level, and men will be put to work stoping in a few days. About 230 tons of ore are now on the dump ready for milling. The ore is all first-class, and when run through the mill will turn out bullion fast.

Notes.—The ore from the Morning Star mine is being brought down at the rate of about 4 tons per day. A new road is being constructed to the Betty O'Neal mine; the grade will be more gradual than the old grade. A contract has been let on the Morning Star mine to Messrs. Sweet & Oreives to sink the Morgan incline. The Dahlgren Mining Co. has considerable ore in the Eagle mill, but is waiting for the management to make some arrangements for working their ore.

SANTA FE DISTRICT.

The Gold Bar.—Esmeralda *Herald*, April 8: This mine, situated in Santa Fe district, is turning out some rich ore. The ledge is small, averaging only 18 inches, but that is big enough when the lowest assay is, $110 while the highest runs up to $770 per ton. The incline shaft is about 50 ft down. The mine is owned by Adam Glasser, Jos. Gruber and John Fagan.

ARIZONA.

Bullion from Dos Cabazas.—*Gold Note*, April 5: Among the lots of ore recently worked by the Cincinnati & Pittsburg Milling Co. were 30 tons of rock from the Mina Chiquita mine, at Silver Camp, owned by Messrs. Fitch & Lynch. This mine has only been worked a short time, and thus far it can be called nothing but a mere prospect. The 30 tons were taken out while sinking a shaft, and cannot be considered more than a fair sample of the ore contained in the mine. The clean-up netted over $5,000 to the owners.—not a bad showing for rock extracted while sinking. The picked specimens were all sacked, and have not as yet been worked. The mill is now running on ore from the Juniper mine. This immense gold mine was leased a short time ago to Thomas Hatton, Wm Hanmore, John Casey and Fred Plum, all experienced miners and energetic men. A force of men was immediately set at work, and since then operations have been strenuously pushed forward. About 100 tons have been worked, which cleaned up $40 to the ton. Before a general clean-up is made, however, 300 tons will be worked. About 25 tons are run through every 24 hours. There is little doubt that all of the ore will average $40 to the ton, and it is thought the boys owning the lease will realize from their efforts, in the 6 months' time it has to run, the handsome sum of $60,000. They are all deserving men, and their numerous friends are much pleased at the prospect of their good fortune. Ore is coming in so fast from various mines that the mill is unable to receive it. Contracts are being made months ahead, and 3 or 4 custom mills, as large as the present one, would be kept constantly running for years to come, if they were on the ground.

A Bonanza Struck in the Juniper.—Last Thursday morning the miners at work on the famous Juniper mine made a strike that will fully establish its claim to the best and largest gold mine in the world. The shaft has been sunk to a depth of 50ft. A drift has been run in on the ledge about 40 ft from the bottom of the shaft, easterly. While at work in this east drift a vein was struck, about 2 ft in width, the ore from which runs from $400 to $2,000 per ton. This is a lucky strike for the boys who hold the lease on the mine. The point where the rich vein was struck is about 100 ft from the surface.

Ayer Camp.—From Mr. S. Porter, a prominent merchant of Dos Cabazas, who visited the above-named camp, in the Chiricahuas, last week, we glean the following particulars: The new smelter of the Chiricahua M. & M. Co. is admirably located, about 1 mile distant from the principal mine, in a canyon through which winds a stream of running water. An abundance of timber lots the surrounding hills. The water runs into the smelter, so that no pumping, is required. No expense or time has been spared to procure the most improved machinery. Several hundred tons of high-grade ore are on the dump at the mine, and the prospect appears flattering. The smelter commenced running last Wednesday.

IDAHO.

Ore Body in Mayflower.—Wood River *Times*, April 5: Last Saturday evening a new ore body was uncovered in the Mayflower mine, at Bullion. This strike was made in a crosscut run from the 50 level of the new shaft, which has been sunk since Supt. Havens took charge of the mine. This shaft was started last summer by Colonel Wall, and sunk 8 ft. As the appearance of the formation did not suit, the shaft was abandoned. When the new company obtained control of the mine, Supt. Havens erected his steam-hoisting works over the shaft, and sunk it to a depth of about 60 ft. He then opened a level at the depth of 50 ft, and soon began to crosscut the ledge. After driving about 20 ft, galena was discovered, but in loose bunches, and accompanied with carbonate ore. Soon, however, a seam or two was cut into, and yesterday morning, when the *Times'* reporter left Bullion, the ore-vein showed to be 7 ft in width, and had every appearance of being still wider.

Sloo Mine.—Wood River *Miner*, April 5: The Sligo mine, the eastern extension of the North Star mine, was bonded last week to a gentleman of this city for 30 days at $20,000. A force of men has been put at work on the mine and will develop it as rapidly as possible until a sale is effected or the term of the bond expires. The property was located by Martin Freeman, John Faley and Harry Billeny. A large vein of high-grade ore has been uncovered, and the mine is at present a very promising one. The rich body of ore found in the North Star extends through the Sligo claim,

The Open Season.—For four long, consecutive months the inhabitants of Wood River have been surrounded by snow, varying, according to place and circumstances, from 2 to 15 ft deep, and with the exception of merchants and a few mechanics, the people have had very little to do but to watch and wait for the coming of spring. Many have been despondent, and expressed fears for the future of Wood River, while others have openly attempted to give away the country by furnishing outside papers with exaggerated reports of the condition of things in general. Fits of "the blues" attacked almost everyone, but now the scene has shifted. An early-rising, genial sun is rapidly transforming the mountains of snow into creeks and rivulets, which, following the natural courses, are speeding away through the great Snake and Columbia rivers to the peaceful ocean lying far to the west. The merry feathered songsters, the first heralds of spring, are once more with us, and the heat of old Sol's rays is warming the hearts of humanity in general, in those parts. New faces are met everywhere along the river; the merchant has abandoned his late morning nap, and is seen bustling about, overhauling his goods, for the purpose of making his place more attractive to the customer; the hotels and lodging-houses are being rapidly filled; an unprecedented impetus has been given to building in this city; the seeker after employment, so long idle, has all the work he can attend to.

MONTANA.

The Original Butte.—*Inter-Mountain*, April 5: For some time it has been known that the Original Butte is looking remarkably well in the drift extending west from the 200 level of the Gagnon. The ore body assays high in silver, carries a heavy percentage of copper and is well defined, clean and compact. The ore body at present varies in width from 7 to 9 ft, and sample shipments made to the Colorado smelter have yielded very satisfactory returns. But while these explorations on the 200 level have been so actively progressing, the deeper development of the mine has been going forward with no abatement of energy. The 300-ft south crosscut has been driven 175 ft, passing through the vein to the hanging wall, along which a drift west has been extended 28 ft. Up to within the past few days the ore at this depth was found in pockets and irregular streaks, but as the drift advanced the vein became more compact and uniform, and to-day presents a very satisfactory appearance in the face, where it shows a solid ore breast fully 4 ft across and still increasing.

A Concentrator Being Erected.—Down on the flat, a few hundred yards from the depot, is a piece of land recently bought of Wm. Owsley for $1 500, by John Loogmaid. On this property the latter is now erecting extensive concentrating works, in which he proposes to treat 40 tons of copper ore per day. The Shakespeare Parrot mine is a far more valuable property than it is generally supposed to be. The lower workings show fully 7 ft of ore, some of which assays from 35 to 60 copper. A considerable amount of this grade of ore has been shipped in a crude state to Baltimore and has paid a handsome profit. The lower grade of ore, of which a vast amount is available for extraction, requires concentration before it can be shipped to advantage, and it is to meet this requirement that Mr. Longmaid is now erecting his works. It is more than likely that a smelter will also be built, as the mine has doubled in value and productive capacity since it was sold for $30,000 a few months ago.

NEW MEXICO.

Sold.—*New Southwest*, April 5: Mr. Henderson has bought from John Black, the Silver King, in the Bullard Peak district. Price, $2,000. Mr. Henderson has sunk 2 shafts of 24 and 21 ft deep, and has a drift besides.

Carlisle.—The development work on the Carlisle mine at Steeple Rock is being forced ahead as fast as 3 8 hour shifts can push it. The 3 shafts are down about 50 ft, and are making from 2 to 3 ft every 24 hours. They are all in ore that assays about $28, and up to the present everything is satisfactory. Manager W. A. Farrish appears satisfied with the prospect, but will probably go down 100ft on each shaft before he gives any decided and definite opinion.

Sherman.—Manager Henderson is pushing the development work on the Sherman, and will soon commence milling ore. The main working shaft is now down 72 ft, and, judging from the present dip of the vein, will cut the ore body at a depth of about 250 ft. The vein is from 2 to 8 ft thick, and the ore runs all the way from $20 to $100 to the ton.

It is just four weeks ago since J. C. Woodward & Co. bonded to C. O. Pearce the Mollie S., Capt. Kid and Star of Empire mines. The latter said three, along with 4 other adjacent properties, to J. K Cooding & Co., of Socorro, and the latter at once put on a force of men. To-day there are 28 men on the pay-roll; about 325 ft of shafts and drifts have been excavated, and from them have been taken and shipped 75 tons of good ore.

The Mimbres M. Co.—The Mimbres M. Co., of Georgetowo, have 250 men on the pay-roll. Col. Robinson, the superintendent and general manager, is developing the property in a thoroughly systematic manner. The company owns 8 claims, known as the Uncle Sam, Lou, MacNulty, Naiad Queen, Satisfaction Extension, Glammorgan, Lucas, Hague, and a fractional part of the original Satisfaction claim. They cover an area of 20,000 ft in length and 6,000 ft in width. The company owns one of the most complete 10-stamp mills in the Territory, which has 8 pans, 4 settlers, 1 agitator and 2 Frue vanners. They have shipped $350,000 in bullion since they came into possession of the property, and their ore averages about $60 to the ton.

OREGON.

Notes.—*Sentinel*, April 8: The pipes and both giants at the Sterling mine were moved this week and the Superintendent, Mr. Ennis, thinks the pipes will not have to be moved again for several years. The water will probably hold out at this mine until August.....Enquiry is being made for samples of ore from the "Yank" ledge by parties in Portland who desire to test it.....The English company and Bluo Gravel, on Galice creek, are both running with full heads .....Cin Len is still running 2 giants. His ground is as rich as formerly but not so profitable on account of increasing difficulty in moving it. .....A $14 nugget was picked up on upper Applegate last week.....There are now a number of men prospecting on the Coleberry fork, of Applegate.....Dick Cook is still pushing his tunnel on the famous Steamboat ledge. The quartz is beginning to show a little free gold occasionally.....Small quantities of dust continue to come in from the small mines, but the mining season in short gulches will soon be over.....Wimer & Simmons of the rich Waldo claim are working night and day without interruption, but do not expect to clean up before fall.

UTAH.

Lolu.—Southern Utah *Times*, April 8: Work on the Lulu is being pushed ahead, and the drift continues to look more favorable for ore as it advances.

The copper mine belonging to the Mahoney Bros., in Cactus gulch, is looking well. They have started up work on it, and it is reported that a body of high-grade ore has been struck.

The Horn Silver Co. is sinking a prospecting shaft near their west line, and it is now down over 100 ft. The claim joining on to the Horn Silver at this point is the Dives, which is to be thoroughly prospected this season.

Work is being pushed ahead on the Comet with gratifying results. The ore continues to get bigger as the tunnel goes in. The owners are confident that a reasonable amount of work, properly directed, will show up big.

The motion of the Star route case defenders will probably be overruled and the cases set for the last week of this month. The trials will last two months. Attorney-General Brewster has given up his project of managing the Star route cases in person, and will rely on Mr. Merrick, giving occasional encouragement by his presence in the court-room when convenient.

Wheat Cleaners.

The use of wheat cleaners attached to thrashing machines is becoming general, and farmers are demanding, more or less, that thrashers thrashing for them should use them. It will not be long before they will be as indispensable to a complete rig as the cook-house has become, owing to the system that is being rapidly perfected here to strictly grade all wheat put on the market. The result cannot but inure to the reputation of California wheat abroad, and we welcome them as great auxilliaries in elevating the standard of our wheat exports.

The advantages of a cleaner are not all on the side of the farmer, as it enables the thrasher to relieve his separator by using a coarse sieve, lowering the wind blast and let the cleaner do the rest of the work, thereby avoiding the one great trouble of blowing grain over the shoe into the chaff pile.

We illustrate on this page a new wheat cleaner, the invention of G. W. T. Carter, of Byron, Contra Costa county, whose plant of thrashing machinery was illustrated and described in the PRESS Nov. 19, 1881. Mr. Carter used several of the cleaners now in the market last season with his machines, but found them, as others have, so deficient and troublesome, that he set to work to make a cleaner that would do his work rapidly and satisfactorily. In the construction of his cleaner he has aimed to overcome these troubles, and now offers to his brother thrashers, a cleaner which he assures us runs smoothly and quietly; does not require constant attention to keep clean, nor half the crew to put it in position. It is built on the ordinary header gear, so it will keep in the road and handle easier than when the wheels are 8 feet apart.

Zinc screens, six feet wide, with round holes are used. The elevator is placed in the middle of the back of the cleaner between the sills, instead of on the side. At the bottom of the elevator is a hopper with a slide gate into the elevator, which regulates the amount of feed to the sieves; so that when a dump of clear wheat goes through the separator it cannot overload the sieves, and run good wheat over with the tailings; the hopper holds it till it is gradually worked off. The elevator discharges upon a distributing board which distributes the grain evenly over the sieves, whether feeding fast or slow without any adjusting; thence upon and through a coarse sieve, where it encounters a strong blast of wind; thence upon a slide which discharges it at the upper end of the series of zinc screens, and passing over these screens to the front, is discharged into the sacks. The discharge is high enough so that the grain spout used on the separator can be used on the cleaner.

All the sieves, screens, and cleaning apparatus are in one shoe, supported by two springs on each side, driven by a cam movement of one-quarter of an inch, with a speed of 600 revolutions per minute.

The cleaning is complete, rapid and saving, scarcely a kernel of wheat finding its way anywhere except into the sack where it belongs. The best principles of "mill cleaning" have been applied to this cleaner in a light and compact form. The grain is conveyed from the separator to the hopper, with an auger driven by a simple device. Unlike other cleaners, it does not have to be built according to the side of the separator the parties intend to use it, (and after which they cannot be used on any other side), but it can be used on either side of the separator, whenever desired. In cleaning up the sheets about the sack-tender, they can be emptied into the hopper instead of taking them to the derrick.

Steps have been taken to secure a patent on this device. Any further information can be had by addressing the inventor, G. W. T. Carter, at Byron, Contra Costa Co., or M. C. Hawley & Co., S. F. The cleaners are being built at Jackson & Truman's shops, in this city, where they can be examined by all interested.

MINERAL ZONES.—Experts, when called upon to "swear" upon a mining suit, are prone to dilate at great length upon "mineral zones," particularly if they are hired to establish the existence of such a thing by the plaintiffs—the defendants seldom having to do with anything larger than a lode or vein. The following definition recently given a man of Tombstone by one of the most celebrated of Pacific coast experts, will enlighten the public on what constitutes, in law, a mineral zone. He says: "Well, now, I'll tell you what a mineral zone is: A man goes into a district and makes a discovery and locates a claim. He then makes another location upon the east and another on the west. He sinks a shaft in the center two or three hundred feet deep and then drifts west two hundred feet and cuts a vein; that's ledge number one; he then runs along another one or two hundred feet and cuts another vein. That's ledge number two. He goes ahead again, and cuts another vein, and that's ledge number three. He does the same thing on the east, and finds nothing but veins or ledges. Now, suppose this man had only made the one location, and John Roe had come along and located on the east side of him, and Richard Roe on the west, and he had gone on and sunk and drifted and cut these same veins or ledges in John's and Richard,s ground, that would constitute a mineral zone." The history of mining is full of such instances, and expert witnesses were invented to establish such facts.—*Tombstone Epitaph.*

Permanence of the Tombstone Fissures.

"Will the mines go down?" has been, says the *Epitaph*, the question of paramount interest since the discovery of Tombstone, and still remains so, notwithstanding the fact that the 600-foot level has been opened out in the Grand Central and shows a strong and well-defined ledge, with every indication of permanence and continuity down to unfathomable depths. If the origin of the Contention fissus, upon which the Grand Central is located, is of igneous origin, as asserted by Prof. Blake in his paper on the "Geology of Tombstone," read before the American Institute of Mining Engineers, then there can be no question of the lode going down, and that, too, with a probable increase in size and strength. Thus far the developments in the Grand Central substantiate this view of the case, the ledge so far developed on the 600-foot level being stronger than at points nearer the surface.

The question of the continuation of the ledge downwards being settled in the affirmative, the next question is as to its probable ore-bearing qualities. For a solution of this last and equally vital point, we are compelled to draw our conclusions from analogy Looking over the broad field of mining, the world over, we find that where true fissures have been subject to extensive operations, the ore has been found to make with the ledge, in variable quantities it is true, to the utmost depth attained upon them. Another fact to be taken into account is the manner of occurrence of ore laterally within these fissures. It is a well-known fact that the paying bodies are found in chimneys or chutes of ore of variable lengths, often separated by long intervals of barren ground. Thus, too, in depth these ore bodies are found to have a limit succeeded by barren vein matter. Take the Comstock as an illustration. The surface bonanzas commenced on the north with the Ophir, thence going south came the Gould & Curry, Chollar and Gold Hill mines. The deep bonanzas were California, Consolidated Virginia, Savage, Hale & Norcross and Belcher, being sandwiched in between the lesser surface deposits. That a similar condition of occurrence of the bonanzas in the Contention fissure will be found, we have every reason to believe, and that the utmost limit of production will be reached before a depth of 1,500 to 2,000 feet is attained is hardly probable. What may be found below those points nothing but persistent work will tell.

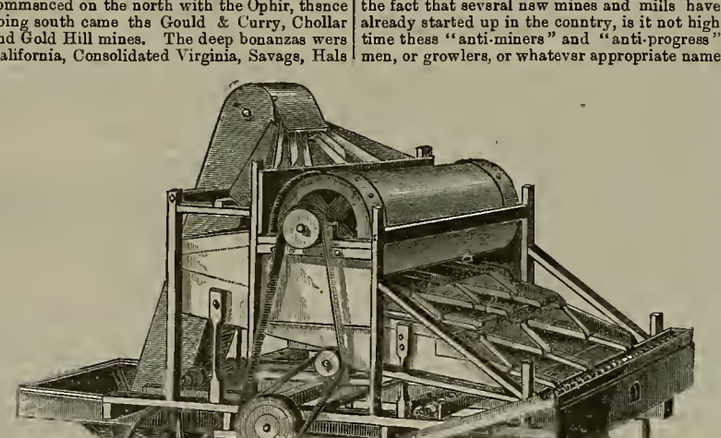
The water problem in the new Grand Central shaft remains unsolved, notwithstanding two weeks have passed since the first strike was made. On Thursday last a drill-hole in the bottom of the shaft brought forth a strong stream that indicated a near approach to the fountain head. The hole was immediately plugged up and the work of timbering the shaft resumed, in order that when the shots were fired, if a strong flow should result, no damage by caving in of the shaly sides of the shaft would ensue. The timbering was finished last evening and the plug withdrawn, when it was found that the flow of water had considerably abated. Another deep hole had been put down in hard rock without any flow of water whatever; therefore, it was the opinion of the foreman that the hole of Thursday had merely tapped a vein of no great extent. Preparations have been made for handling the water until the flow shall equal several thousand gallons in the 24 hours, after which a pump will have to be put in. The drifts north and south along the ledge on the 600 level are in about 110 ft each, and the ledge is steadily improving. Heretofore the ore has been bunchy in the mass of vein matter, whereas now it is becoming more uniform and of a much better grade. A most remarkable feature is the disappearance of silver and the large yield of gold in the ore, the assays for several days showing hardly a trace of the former metal, and giving a range between $86.25 and $115.75 per ton gold. A bonanza of this kind of ore will make the Grand Central more famous than it has been with its argentiferous record of the past.

GENERAL HURLBUT, U. S. Minister to Peru, died suddenly at Lima on March 28.

Oregon Quartz Mines.

The *Bedrock Democrat*, of Baker City, Oregon, says: "We are highly pleased to see that many of our placer mine enthusiasts are turning attention to prospecting for quartz and developing the ledges already discovered. They are beginning to fall in line with the little army of progressive spirits who have been laboring unceasingly to bring our mineral resources to the notice of capitalists. In nearly every instance, the class of whom we speak are old-timers, men accustomed to rich placer and seam diggings (yet, to the credit of many of our early miners, we are proud to find them among the most enterprising and successful of our progressive miners), but it is a well-known fact that nearly all of the quartz discoveries made within the past few years were by men who came to this country since the palmy days of placer and seam mining. Many of the good old pioneers were aware of the existence of gold-bearing ledges, which prospected only a few small colors—probably $12 or $15 rock—which they little thought would, in the near future, prove a better property than their ounce diggings. Men accustomed to making money easy and spending it freely, are usually not the men to see a fortune in quartz which prospects as low as $5 or $8 per ton, and even stay with the lode and develop it into a good property. To-day there are golden opportunities in undeveloped quartz mines all through this section.

A few years hence many will regret they did not prospect more carefully and extensively their claims. Of course we know that it is not all gold that glitters, and that every ledge which shows a prospect will not prove a paying property; but we do claim that a little more energy on the part of claim holders will surely add several more good mines to this district. Then in the face of this reasonable view, and the fact that several new mines and mills have already started up in the country, is it not high time these "anti-miners" and "anti-progress" men, or growlers, or whatever appropriate name you may call them, were seeing the folly of their course, and taking an active part in the encouragement of bringing to light the millions of hidden treasure which no sane person can reasonably doubt lies within a practical working depth within the limits of our district. Shall we not increase our energies and explore our mines to a reasonable depth rather than linger along for years, and finally leave the work and its fruits to the experienced quartz miners of other go-ahead camps, who are already looking this way. We do not wish to portray this subject in a false light, nor as an enthusiast. We are simply trying to show up our mining advantages as they are, and giving a few words of encouragement to our miners, as well as chiding those who appear to have a mania in crying down our quartz-mining industry. Time is certainly demonstrating that these anti-miners don't know it all.



CARTERS' NEW WHEAT CLEANER.

MACHINERY for the Yaqui Milling & Mining Co., of Sonora, arrived at the depot yesterday, and is now being transferred to teams waiting to convey it to its destination. The 25-horse power movable engine is mounted on wheels, by which it not only becomes more easy of shipment, but much time is also saved when putting it in place for work. A 10-stamp mill is sufficient for the present wants of the company, but it will be further enlarged as necessity may require.—*Arizona Citizen.*

THE Stanislaus *Wheat Grower* says: The Mount Diablo coal vein continues east, in all probability, into the Sierra Nevada. The vein dips at an angle of 15°, until it passes under the San Joaquin river, when it rises to the surface at about the same angle. Some prospecting in the foothills northest of Knight's Ferry would probably result in the discovery of a ledge.

IT IS stated that a 20-stamp mill will be erected on the Magna Charta, Montana, the coming season. This would give the Alice company 100 stamps. There is no doubt about the capacity of the mines to keep them in continuous operation.

Questions for Mining Engineers.

Blasting and Hoisting Coal.

A few weeks ago, Mr. C. M. Percy, well known from his connection with the Wigan Mining and Mechanical School, retired from the services of the Wigan Coal and Iron Co., on which occasion an exceedingly large audience assembled in the lecture-room for the purpose of witnessing the interesting ceremony of a presentation to that gentleman. A number of speeches were made, which are reported in the *Colliery Guardian*. Among them was one by Mr. Eckersley, ex-High Sheriff of Lancashire, in the course of which he made some suggestive remarks which we present in an abbreviated form:

Scientific improvements were being daily developed, and it was necessary for anyone adopting the engineering profession to keep pace with those advances. He ventured to submit there were two great questions demanding their attention. The first was, how were the fiery seams of coal to be worked without the great loss of life which at present prevailed? The second—and he thought the practical attention of mining engineers and colliery managers should be directed to it—was as to how sciences could be applied with the view of reducing the cost of raising the coal to the surface, reducing it to such a price as would give the proprietors a reasonable return for their invested capital, and the workmen an ample and a fair remuneration.

These were grave questions, requiring the consideration of men of science and of those upon whom devolved the management of the mines. He confessed that he was one of those who believed that if the use of explosive substances was entirely prohibited in working the coal seams of the district, a great saving of human life would be effected and coal would be raised with a greatly diminished percentage of slack or small coal. Gunpowder was very violent in its action, and ought to be dispensed with in coal-mining. He hoped that shortly some more improved method of winning the coal would be introduced, and that the working man would be able to earn his daily bread without having to resort to the use of gunpowder. What was the object of using this dangerous element? He understood it was that the coal might be more easily loosened and rendered convenient for removal. That seemed a very simple matter, but when they had this explosive substance to contend with—a substance that had to be used in every place where man had to be employed on the following day—he could compare it to nothing else but a series of small guns let off one after the other like soldiers firing a *feu de joie*. It was true that the effect produced, placed the material in a favorable position for removal on the following day, but in his opinion this was secured at a great expense. In the first place it gave the gas pent up in the coal seam an opportunity for escaping, which might otherwise remain there if left undisturbed by the combustion. In the next place, it gave a violent shock to the roof; in fact, every time a shot was fired it produced a similar effect to that of an earthquake. Were blasting with gunpowder in mines discontinued he was convinced they would hear a great deal less of falls of roof; and if they took even a lower view of the question he would say that blasting was an expensive process. He estimated that the depreciation consequent upon the use of gunpowder was not less than from 16 to 20 per cent. of the whole of the coal raised. There could be no doubt that blasting shattered the coal to such an extent that 33 per cent. of it fell into slack or small coal, and that, he calculated, made a depreciation of from 16 to 20 per cent., as he had already stated. The question was one worthy of the serious attention of mining engineers and mining students, and he hoped it would receive that attention which it deserved.

WATER LEVEL IN TOMBSTONE.—The Tombstone *Epitaph* says the permanent water region in the Grand Central mine has been found, and at 18 ft. below where first struck the flow became so strong that work had to be suspended last Wednesday, and now it has raised up to the point where the first seepage was discovered, making 18 ft. in the shaft. No further sinking can be done until a pump is put in to handle the constantly increasing flow as they go down. It is to be hoped that Mr. Gage will decide to follow up the important work that he has thus far so successfully carried out in the systematic development and working of this great property. Should he decide upon pumping machinery when he returns from a visit East, it will take at least 90 days to get it in working order; therefore, under the most favorable circumstances, at least four months must elapse before any sinking can be done. There is a very great interest felt in this matter by every miner in the district, for the reason that so much depends upon results below water level. One thing has already been settled in the Grand Central mine, and that is, the ledge is quite as strong on the 600 level as at any point above, and quits as well defined.

VERY heavy snows have fallen during the past winter in Idaho and northern Utah, and it is feared that on the approach of warm weather the Utah & Northern railroad will have much trouble with floods.

The Engineer.

The Brooklyn Bridge.—Mr. W. A. Roebling, Chief Engineer of the Brooklyn bridge, states in a recent report, in giving a detailed account of what has been done to strengthen the superstructure, that the aggregate strength of the wire composing each of the four cables has been estimated to be 12,300 tons (of 2,000 pounds) and the elastic limit, two-thirds of that amount—namely, 8,200 tons. From all the tests made, the average strength of all the wires was not placed too high. The method of splicing the wires was such that the full strength of the wire was maintained at all points. The superstructure consists essentially of the floor system and stiffening trusses. One of the most serious difficulties to be contended with in this structure is the maintenance of the balance of spans arising from the exceptional length of the land spans. Mr. Roebling gives the total weight of the bridge, including the transitory load, as 17,780 tons, from anchorage to anchorage—3,460 feet. Mr. Roebling adds: "It being the wish of the Board, as shown by the resolution annexed to the report of the committee, of which Mr. Kinsella was chairman, on the 6th of May, 1878, that the bridge should be adequate to the passage of the Pullman car, it became incumbent upon me to provide the necessary truss power with which to transfer the concentrated loads and to check the increased deformation of the cables resulting therefrom." He explains in great detail what he has accomplished, and finishes the report with the words: "The cables are strong enough to pull up the two anchorages."

The Tunnel from Sicily to Italy.—The length of the submarine tunnel between Italy and Sicily will be about 43,296 ft. The minimum depth of the sea above the line of the tunnel is 360 ft., and the thickness of rock between the roof of the tunnel and the bottom of the sea is 114 ft. The direction of the tunnel from St. Agata to Punta del Pizzo is almost due northwest to southeast, the two inclines leading to the tunnel running parallel with the above for some distance and then descending to the lowest level by spiral tunnels. The length of each of these inclines is 14,640 ft., and the degree of inclination will be about 35 per 1,000, this having been found by experience to be perfectly practical. According to the opinion of all geologists, the bottom of the Straits of Messina consists of crystalline rock (granite gneiss and mica schiste). Neither in Calabria nor in Sicily can the upper strata that cover this crystalline rock be so thick as to reach the level of the bottom of the descending inclines. Geological and hydraulic considerations agree in the conclusion that the submarine isthmus between Punta del Pizzo and St. Agata cannot consist of material that is compact or easily corroded.

The Bay of Biscay Canal.—The project of uniting the Bay of Biscay with the Mediterranean is beginning to be seriously talked of. The length of the canal will be 270 miles, and the estimated cost $248,000,000. The projectors assume that the canal, when constructed, will take almost the entire trade from the Atlantic to the Mediterranean, leaving the famed fortress of Gibralter to watch over waters undisturbed by ships of traffic. The canal would undoubtedly reduce the importance which Gibraltar now holds as the key to the Mediterranean, but there seems some doubt if it can be made profitable as a business venture. There would be very little saving of time by the new route, after allowing for the slowness of canal travel, compared with that on the open sea. But, in the event of war, the French might find it convenient to run ships into the Mediterranean, without passing under the guns of Gibraltar.

Washington Monument.—The engineer in charge of the construction of Washington monument, in Washington, reports that the addition to the hight of the structure since the work was renewed, Aug. 7, 1880, is 100 ft. The monument is now 250 ft. high above the base. Seventy-four ft. were added last year. The balance of appropriation available December 1st was enough to carry the obelisk to the hight of 286 ft.

Oldest Timber in the World.—The ancient temples of Egypt are believed to contain the oldest timber in the world, in the shape of dowel pins, which are incorporated with stone work known to be not less than 4,000 years old. These dowel pins, according to the appearance they present, are thought to have been made from the tamarisk or shittim wood—in ancient times a sacred tree in Egypt.

Cologne to be Made a Seaport.—It has been proposed in Germany to dredge the Rhine, so that Cologne may become a seaport. The proposition has been received with much favor and with some apprehension on the part of Hollanders and Netherlanders, through fear of serious injury to the ports of Antwerp and Rotterdam.

The Austrian government now works 200 miles of railroad which it owns, and 1,194 miles belonging to companies, while 407½ miles that it owns are worked under contract by corporations.

Useful Information.

Removing Paint.

A preparation, of which potash and soda are the principal components, has just been introduced into England, and is said to be a perfect paint remover. Some experiments made with the preparation upon various specimens of wood and metal, all old samples, well painted with several coats of good oil colors, were very successful. The compound, which is of a cream-like consistency, and quite white, is spread over the painted surface, and after being left on a few minutes is wiped off. Its action upon the body of the paint is thorough and complete, a saponification is set up which continues, the soda is liberated, and this process goes on, the alkali being liberated as it is wanted, till the whole of the paint is removed. Painted surfaces in about a quarter of an hour show every trace of paint cleanly removed, and the wood exposed as if it had been planed.

The action of this preparation seems to be two-fold. There is, first, the destructive action of the applied alkali, always caustic, and, next, a continued sponge-like action going on: in other words, a constant and perfect causticity is maintained. The result of the preparation on metal is equally convincing. A gas meter, if exposed to the compound about 20 minutes, has the japan removed and the bright metal exposed. Other forms of the preparation are of a weaker character, and nearer soap in their composition. They are intended to remove dirt, and their action is just the reverse of the compound already described. The preparations are liquid and are soluble in water, and their cleansing power upon cloth of an unmistakable dirty and greasy character is said to be almost magical. These solutions are adapted for delicate carvings and fabrics of all kinds and their use by restorers, decorators and others will be highly esteemed. The modification of the solution for cleaning cloth is well adapted for restoring the linings of railway carriages and stuff seats of all descriptions. No scraping or erasing is necessary, and there is nothing injurious, it is said, in the preparations which can attack or injure metals or cloths. They all produce a minimum action on brushes, which is a consideration, and, what is very important, the color is not taken out by the use of the solutions. The price is less than that of other preparations. The "paint remover" can be easily applied by being spread over the painted surface to be removed. It is sold in five-pound tins at about 60 cents.

An Elastic Lacquer.—A patent has been taken out in Germany for a new description of elastic and flexible lacquer, which will not peel off, and which is suitable for the coating of carriage cloths, plans, and other articles to be folded up, as well as for wood and iron work, walls, etc., but which may also be employed as an insulating layer for damp rooms as a means against dry rot, and in rendering stuffs water-proof. To produce the lacquer, 50 kilogrammes of linseed oil varnish are heated up to a boiling point. In another vessel about 15 kilogrammes of lime are slaked in 20 kilogrammes of water. As soon as the lime boils, about 50 kilogrammes of hot melted caoutchouc are added to the lime water, and the whole is then stirred until it has become thoroughly mixed. The composition is poured into the boiling varnish, the whole being stirred all the time. Further stirring takes place until a homogeneous mass is formed, which is afterward strained or filtered, and left to cool. After cooling, the lacquer has a pap-like consistency. To apply the lacquer it is diluted with the desired quantity of varnish, and put on with a brush, either in a warm or cold state; but it is said to be better to apply it warm, as then no varnish is required for diluting it. In rendering linen water-proof the lacquer may be put on by means of a brush or roller. After treatment, the linen or other stuffs, paper, etc., are hung up to dry. Stuffs are perfectly dry and ready for use in two days. The product is stated to be lustrous, elastic, not sticky, and perfectly water-proof.

New Hair Dye.—A one per cent. solution of nitrate of silver gives to human hair a dull reddish brown, which is particularly unnatural and disagreeable in a strong light; but this defect, which is visible in all cases in which nitrate of silver has been used, may be obviated by the addition of a certain amount of copper salt to the argentic solution. Nitrate of silver, 30 grams; sulphate of copper, 2.5 grams. Dissolve the two salts in 250 cubic centimeters of water, and add sufficient ammonia to dissolve the precipitate formed, and make it up to one liter. An instantaneous dye may be made by steeping the hair in a solution of pyrogallic acid in acetic acid, and then in the argenti-cupric solution dissolved above. The hair should be allowed to dry partially after the application of the pyrogallic solution. By varying the proportion of the pyrogallic acid from 1 gram to 50 grams per liter, any tint may be obtained from light brown to black.—*Moniteur Scientifique.*

Formula for Soap to Wash with Sea Water, After the Process of Rome and Mollard.—For one boiling of 116 gallons, take: Lye at 13°, 66 gallons; oil of copiah, 22 gallons; palm oil, 22 gallons, oil earth, nut, or olive oil, 2½ gallons; silicate of soda, 3½ gallons; total, 116 gallons, nearly.

India-Rubber Varnish.—Dr. Elder gives the following recipe for making India-rubber varnish: Inclose 30 grams of finely-cut caoutchouc in a capacious linen bag, and suspend this within a flask containing a liter of benzine, by means of a thread held fast by the stopper, so that the bag remains near the surface of the liquid. In the course of six or eight days, the soluble portion of the caoutchouc—about 40 to 60 —will pass into the benzine, while the contents of the bag will expend enormously. The clear solution, which is quite viscous, and contains 1.2 to 1.5 of caoutchouc, is then carefully separated. The swelled contents of the bag retain one-fourth to one-third of the benzine used, and may be utilized for the preparation of an inferior kind of varnish. A solution of India-rubber in benzine, kept in half-full bottles, is decomposed on exposure to light, which may be seen by the change in the solution from a viscous to a thin fluid condition. Even in the dark this change goes on, but it takes about three times as long.

Transparent Leather.—Messrs. L. Starck & Co., of Mentz, Germany, have patented a new process for manufacturing transparent leather. Common skins are deprived of the hair, cleaned and spread on frames, and are rubbed with a mixture containing 100 parts glycerin 26° B., 0.2 parts sallicylic acid, 0.2 parts picric acid, and 2½ parts boric acid. Before the skins are perfectly dry they are brought into a room from which sunlight is excluded, where they are impregnated with a diluted solution of bichromate of potash, and then dried. The skins are then covered with a diluted solution of shellac in alcohol of high degree. The transparent leather is said to be well-adapted for manufacturing such objects as must possess great strength with small dimensions, as thread for sewing leather, small belts for tools, looms, sewing-machines, etc. The coefficient of strength of this transparent leather is said to be three times greater than that of other leather. Its price is higher for the same weight, but lower for the same dimensions.

True Musk, which is used so largely as a perfume, is taken from certain glands in the musk deer; but its high price has caused Mr. Fairthorne, an American pharmacist, to substitute the similar secretion of the musk-rat. For a long time the Russians have used these skins to scent and preserve their garments; but no attempt has hitherto been made, we believe, to extract the perfume in a serviceable form. Mr. Fairthorne takes ten or twelve musk-rat skins, and cuts them into small slips. These are allowed to macerate for a week or two in a pint of alcohol, with the addition of two drachms of soaked lime. On filtering the liquid, a very fragrant tincture, having a musky smell, three times stronger than the ordinary extract of musk, is obtained. Mr. Fairthorne employs it instead of the real tincture of musk for the manufacture of eau de Cologne.

Good Health.

A Singular Disease in Russian Chrome Works.—The manager of the single establishment in Russia for the manufacture of chrome, reports a curious disease among his men. He says: "The workmen suffer from the action upon the nose of the dust of bichromate of potash, and the disease manifests itself thus: A little hole is formed on the partition of the nose (dividing the two nostrils), and increases gradually until the partition entirely disappears, with the exception of the lower part of it, so that to a superficial observer there is nothing the matter with the nose, except perhaps a little outward depression. It must be remarked that as soon as the partition is gone the process seems to stop there, and neither the lungs, air-tubes, nor throat are in the least affected. Its influence is very different with different individuals. Some workmen, after having been employed for 10 years at the works, remain unaffected, while with others the hole in the nose begins to be formed after one month's work. A general inspection of all the men at the works not long ago, proved that more than 50 of them had diseased noses. When the disease sets in first, the man feels tickling in the nose; a week or so after, it bleeds, and in a few days more there is no uncomfortable feeling of any sort, and thus the hole is formed almost without any pain." There are, it is said, six works of the kind in the world—three in Glasgow, Scotland, one in Russia, one in Austria, and one in this country. It would be interesting to know whether the same trouble has ever been noticed outside of Russia.

A Remedy for Toothache.—Dr. F. P. Atkinson describes, in the *Practitioner*, an English medical work, a novel form of treatment for toothache, to which he was led by Dr. Murrell's results with nitro-glycerine in angina pectoris. Being afflicted with severe toothache, and proceeding on the similarity in effect following the employment of nitro-glycerine and nitrate of amyl, he applied to the aching tooth cotton wool, saturated with Richardson's compound anæsthetic ether, which contains the nitrate. Instant relief ensued, which was maintained for four hours by a pledget of wool previously soaked in laudanum. Dr. Atkinson adds that a 1% solution nitro-glycerine has the same effect in stopping pains as nitrate of amyl; and thus a means of relieving a most distressing complaint is opened up.

Beans as Food.—The nutritive value of beans is very great—greater than almost any other article of food in common use. Considering their richness, they are probably the cheapest food we have, but somewhat difficult of digestion, probably owing to the fact that we rarely cook them enough and masticate inefficiently. In preparing beans for the table, they should first be well soaked in cold water and then thrown into boiling water and cooked until of a medium consistency, between a fluid and a solid, neither too thick nor too thin. They require some acid on them when eaten, and a sufficient amount of salt to render them palatable. They may be eaten with potatoes or other vegetables which contain more starch and less albumen, rather than with too much bread or meat. In Germany there is a process patented by which beans and all leguminous seeds are reduced to a very fine flour, and rendered capable of being used as food by the most delicate persons. We have samples of this flour, which equals in fineness the best wheat flour, and it is used extensively for making soups for invalids. These soups are worth a hundred times as much as beef tea. There is a fortune awaiting any one who will prepare a flour from beans as perfect as this flour from Germany. Bean soup, rightly made, is exceedingly delicious and wholesome, and ought to be used more extensively than it is.—*Sanitarian.*

Moral Effect of Tea, Coffee, etc.—Dr. Beck, of Leipsic, a famous German physician, writes as follows on the moral effect of different articles of food and drink: "The nervousness and peevishness of our times are chiefly attributable to tea and coffee; the digestive organs of confirmed coffee drinkers are in a state of chronic derangement, which reacts on the brain, producing fretful and crying moods. Fine ladies addicted to strong coffee have a characteristic temper, which I might describe as a mania for acting the persecuted saint. The snappish, petulant humor of the Chinese can certainly be ascribed to their immoderate fondness for tea. Beer is brutalizing, wine impassions, whisky infuriates, but eventually unmans. The alcoholic drinks, combined with a flesh and fat diet, totally subjugate the moral man, unless their influence be counteracted by violent exercise; but with sedentary habits they produce those unhappy flesh sponges, which may be studied in metropolitan bachelor balls, but better yet in wealthy convents. The soul that may still linger in a fat Austrian abbot is functional to his body only as salt is to pork—in preventing imminent putrefaction."—*Herald of Health.*

Had His Hearing Restored.—A rather singular occurrence recently happened near the Western and Atlantic crossing on Alabama street, says the Chattanooga (Tenn.) *Times.* Mr. F. Matthews, track master of the Alabama and Great Southern road, has been totally deaf in his left ear for a number of years, caused by cutting railroad iron in a repair shop, and has consulted a number of prominent physicians and auriculists without deriving any benefit from them. A switch engine was standing near, as Mr. Matthews was crossing the track, and, starting up at that moment, the wheels suddenly slipped on the rails, while a heavy jar ensued, followed by a sharp rush of escaping steam. As soon as the noise had in a measure subsided, Mr. Matthews remarked to a friend standing near that his ear had cracked, and began to pull out fragments of some substance which seemed as hard as rock. Upon further investigation he found that his hearing had been entirely restored, and that what experienced men had failed to do had been accomplished by one of the most natural and ordinary occurrences of every day life.

Worn out Before Their Time.—There is perhaps no country in the world where there are so many people who are worn out before their time as in California. The most direct cause of this is the inclination of the people here to overwork themselves. Our climate is so bracing, and generally so favorable to physical exercise that we are apt to work ourselves down before we become aware of it. Then, again, this overwork at first produces excessive appetite, which is too commonly accompanied by over-feeding with flesh, strong drink, and beer, the idea being that this high feeding enables a person to do more work than a more natural diet. In the long run, however, it is not so profitable as moderation, for it too often breaks down the constitution in the prime of life, and leaves a long cup of misery to be quaffed at our leisure.

Remedy for Poison Oak.—Dr. S. A. Brown who is stationed at Mare Island, in this State, announces he has discovered a certain remedy for poisoning from sumac, ivy, etc. It is bromine dissolved in olive oil, cosmoline or glycerine. He used 20 drops of bromine to one ounce of oil, rubbing it on the affected part 3 or 4 times a day, and washing it off occasionally with castile soap.

Keep the Children Warm.—Half the illness and fretfulness of little children might be prevented by keeping them warm enough. They are often so unequally dressed—some parts covered to excess, and others, more vital still, left almost unclothed, that they are in constant discomfort. They cannot tell the difficulty, and thoughtless mothers dismiss the whole subject with the general complaint of crossness.

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SAN FRANCISCO:

Saturday Morning, April 15, 1882.

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Passing Events.

The warm weather for the past week or so has stimulated prospectors in many parts of the country; and where prospecting has not already begun, the men are only waiting for the first opportunity to start in. Probably the sections of this coast which will attract most attention are portions of Montana and Idaho. The region around Butte, Montana, is now receiving a large, new population, and will be pretty well prospected. The Wood River country will, before long, swarm with prospectors, and there is little doubt that very many new mines will be found. Other men, again, prefer the southern country and will try their fortunes in New Mexico and Arizona, or even in Mexico. There are many thousand more men who will interest themselves in mining this year than ever before.

No decision has yet been declared in the debris suit, and little is said on the subject, but a final solution of the difficulty is none the less anxiously looked for.

The discovery of iron ore at Sheep Ranch, Calaveras county, elsewhere noted, is an event of more than passing interest. Iron, copper and lead ores are now in demand and prospectors no longer neglect searching for them.

Production of the Precious Metals.—No. 4.

[An abstract of the Census Monograph on the Bullion output of the country.]

Nevada.

The production of this State shows a considerable decline, as compared with that of the preceding six years. This is not due to any general falling off in the prosperity of the mining industry of the State, but to the decrease in the yield of the leading source, the Comstock lode. From 1871 to 1879, Nevada had outranked all the other states and territories in its output of the precious metals; but in the present census year it has fallen to the third place, having been passed by both Colorado and California. With the yield of the outside districts maintained at the existing rate of production, an important discovery of ore in the Comstock would perhaps raise Nevada again to the first rank. And even without any striking new developments, there is still a reserve of low-grade ore and tailings remaining unworked, sufficient to give a large and steady product for many years to come.

In 1876 the yield of the Comstock, according to Mr. Del Mar's careful analysis, was: Gold, $18,002,906; silver, $20,570,078; total, $38,522,984.

During the census year the product of the whole Comstock district, including the Virginia, Gold Hill, and Devil's Gate sub-districts, the outlying veins, such as the Occidental, etc., and the yield of tailings worked at various points throughout the entire tract known as the Washoe country, was: gold, $3,109,156; silver, $3,813,174; total $6,922,330. Showing, a decline of $31,650,654, or 82.06 per cent., since 1876.

The bullion product of Nevada represents an average of $44.16 gold, $112.29 silver, and $156.45 gold and silver for each square mile of its area. In this respect Nevada is surpassed by Colorado, the figures for which are $25.98 gold, $159.22 silver, and $185.20 total. But with reference to its population, Nevada, even with the reduced output, remains the richest of the mining States and Territories, as its annual product, if distributed equally per capita, would give $78.51 gold, $199.63 silver, and $278.14 total to every man, woman and child within its borders. Notwithstanding the large proportion of adult males, it will be seen that this would be a fair income for the actual working population. The Nevada mines, however, are largely owned outside the State, and although they have not, taken as a whole, been profitable during the year, the local disbursements in wages, etc., continue steadily, so that the inhabitants have a direct interest in the prosecution of work, independently of the question of ownership.

Placer Mines.—The placer yield of Nevada is insignificant. No important gravel deposits having suitable water supply are known to exist. The ground worked is in most cases merely the wash from the croppings of quartz veins. Operations are conducted on a small scale at Tuscarora, Tule canyon, points in the neighborhood of the Comstock, and in a few other isolated spots. The aggregate yield for the year is estimated roundly at $50,000.

UTAH.

The bullion product of Utah is remarkably steady, varying latterly but little from year to year. This Territory presents facilities for arriving at true valuation of the product which are wanting in many other mining localities. The mines are more concentrated, the yield coming from a comparatively few but rich claims, and the bulk of the ore is treated by a few large smelting works and mills, where accurate accounts are kept. It is, therefore, easier to collect full statistics of the product than in places where the bullion is derived from a vast number of sources, each one of which furnishes only a small quota, as is the case where placer mining forms an important factor. The census figures for Utah are also the more reliable from the fullness and clearness with which the schedules were prepared by the special expert for the Territory.

The tabulation of the product is based on returns from 535 deep mines, one placer mine, 18 amalgamating mills, 34 smelting works, and 10 miscellaneous metallurgical establishments, consisting of sampling, concentration, and leaching works. Many of these sources were, however, unproductive during the census year.

The following table shows the amount of ore raised in the several counties. The silver-lead ores sold to the smelters are in many cases transported for reduction out of the district in which they were raised; and as their identity is lost in the mixture of ores from all portions of the Territory, and even from other States and Territories, it is impossible to segregate the bullion yield by districts.

UTAH—Cash Receipts from Ore Sold.

COUNTY.	Ore sold.	Average price per ton.	Total receipts.
	Tons.	Dollars.	Dollars.
Beaver	900	8.00	7,200
Juab	2,253	45.11	102,860
Piute	80	96.06	7,845
Salt Lake	37,855	22.75	861,789
Summit	565.33	13.13	7,420
"	300	40.00	12,000
Tooele	5,859.20	50.42	295,347
Utah	1,857.50	29.68	55,135
Scattered	*180	*60.00	*10,800
Total	49,885.03	27.29	1,360,996

The following is an exhibit of the proportionate amounts of ore milled and ore smelted:

UTAH.—Statement of Ore Milled and Smelted.

COUNTY.	Ore milled.	Ore smelted.	Total ore treated.	Percentage of ore milled.	Percentage of ore smelted.
	Tons.	Tons.	Tons.		
Beaver	.....	18,915.75	18,915.75	.....	100
Juab	3,548	2,258.00	5,806.40	61	39
Piute	.....	80.00	80.00	.....	100
Salt Lake	12,000	37,856.00	49,856.00	24	76
Summit	12,508	565.33	13,073.33	96	4
Tooele	230	5,889.20	5,119.20	4	96
Utah	.....	1,857.50	1,857.50	.....	100
Washington	46,796	.....	45,795.00	100	.....
Scattered	.....	180.00	180.00	.....	100
Total	75,101	57,581.78	142,682.73	53	47

The most noticeable feature shown in the foregoing table is the large proportion of milling ore which Utah furnishes, compared with her base ores, although a Territory generally supposed to be dependent upon her smelting works. It should be noted, also, that of the ore smelted there was a considerable amount which might have been treated by amalgamation, but which, because of the absence of proper milling facilities or because of unusual richness, it was advisable to sell to the smelters. But, while the percentage by weight of ore milled was 53%, as against 47% for ores smelted, the same proportion does not hold with regard to value, the percentage of bullion extracted being only 51.08% for the product of amalgamating mills, as against 48.92% for that from smelting works—a nearly even ratio.

This difference is accounted for by the fact that, as a rule, the ores smelted, on account of the greater expense usually involved, are richer than the ores which will bear the milling expense; and also because of the higher proportion of the assay contents of the ore extracted by the smelting process, as compared with the milling results. The following analysis of the total bullion product of the Territory shows the relative amounts coming from each source:

UTAH—Analysis of Product.

Classification of source.	Gold.	Silver.	Total.
Amalgamating mills, from ore raised during census year	$175,024	$2,247,009	$2,422,033
Amalgamating mills, from ore raised prior to census year	.....	139,518	139,518
Total from mills	$175,024	$2,386,527	$2,561,551
Smelting works, from ore raised during census year	$ 94,989	$2,349,948	$2,444,937
Smelting works, from ore raised prior to census year	1,542	8,444	7,986
Total from smelting works	$ 96,531	$2,358,392	$2,452 923
Total from mills and smelting works	$271,555	$4,742,919	$5,014,474
Placer mines	20,000	.....	20,000
Total	$291,555	$4,742,919	$5,034,474

NEVADA—Production of Deep Mines for the Year Ending May 31, 1880.

COUNTY.	Ore raised during census year.	Average assay value per ton. Gold.	Silver.	Gold and Silver.	Total assay value of ore raised during census year. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Elko	13,224	11.71	122.82	134.53	154,873	1,623,837	1,778,710
Esmeralda	23,731	5.44	53.49	58.93	151,776	1,590,178	1,751,954
Eureka	32,013	19.23	38.84	58.07	1,577,356	3,185,812	4,763,168
Humboldt	11,458	8.24	34.83	43.07	94,397	399,074	493,471
Lander	8,156	.....	151.22	151.22	.....	1,318,579	1,318,579
Lincoln	14,399	1.31	54.81	56.12	18,829	789,271	808,100
Nye	23,817	1.33	30.75	32.08	31,579	732,339	763,918
Storey and Lyon	151,700½	21.75	26.47	48.22	3,517,422	4,279,519	7,796,941
White Pine	11,547	.53	51.00	51.53	5,696	704,459	710,555
Total	315,052½	15.52	41.05	56.58	5,552,328	14,621,068	20,183,396

COUNTY.	Ore raised and treated.	Average yield per ton. Gold.	Silver.	Gold and Silver.	Bullion produced from ore raised and treated during census year. Gold.	Silver.	Totals.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Elko	11,721	9.31	99.27	108.58	109,177	1,163,517	1,272,694
Esmeralda	29,361	4.45	44.88	49.33	130,735	1,317,875	1,448,611
Eureka	79,392	16.37	34.68	51.25	1,300,122	2,768,902	4,069,024
Humboldt	10,644	5.14	28.49	34.63	55,337	303,265	358,602
Lander	7,751	.....	143.19	143.19	.....	1,109,876	1,109,876
Lincoln	10,398	.22	48.78	49.00	2,301	507,276	509,577
Nye	23,817	1.11	25.15	2..27	25,542	523,026	549,568
Storey and Lyon	151,700	18.31	19.85	36.16	2,638,067	3,209,639	5,847,706
White Pine	11,547	.42	50.83	51.25	4,847	586,905	591,752
Total	346,331	12.35	33.47	45.82	4,277,158	11,540,282	15,867,440

COUNTY.	Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year. Gold.	Silver.	Total.	Bullion produced during census year from ore previously raised. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Elko	1,500	*17,750	*175,310	*193,060	.....	.....	.....
Esmeralda	370	540	25,025	25 580	.....	1,459	1,459
Eureka	2,821	37,000	81,050	118,050	.....	.....	.....
Humboldt	814	10,450	18,750	29,200	.....	.....	.....
Lander	415	.....	*98,401	*98,401	.....	.....	.....
Lincoln	4,001	16,004	200,050	218,054	.....	.....	.....
Nye	.....	.....	.....	.....	.....	8,962	8,962
Storey & Lyon	.....	.....	.....	.....	*561,089	*713,535	*1,274,624
White Pine	.....	.....	.....	.....	.....	118,000	116,000
Total	9,721	81,744	598,587	630,331	*561,089	*839,958	*1,401,046

*Estimated.

UTAH—Ore Production of Deep Mines for the Year Ending May 31, 1880.

COUNTY.	Ore raised during census year.	Average assay value per ton. Gold.	Silver.	Gold and Silver.	Total assay value of ore raised during census year. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Beaver	19,665.75	0.43	45.47	45.00	8,525	894,309	902 834
Juab	6,256.00	15.05	38.80	53.05	94,148	241 520	335,885
Piute	130.00	40.72	105.92	148.64	5,294	13,789	19,063
Salt Lake	52 5-8 00	3.09	20.39	23.48	182,598	1,079,510	1,233 108
Summit	18 918.33	.....	128.12	128.12	.....	2,133,802	2,133,802
Tooele	7,319.20	.....	58.99	56.99	.....	417,129	417,129
Utah	1,957.50	.....	31.59	31.59	.....	81,837	01 837
Washington	49,895.00	.....	28.71	28.71	.....	1,332,649	1,332,649
Scattered	180.00	.....	*77.57	*77.57	.....	*13,963	*13,963
Total	154,327.78	1.75	39.91	41.66	270,563	0,179,488	8,450,051

COUNTY.	Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year. Gold.	Silver.	Total.	Bullion produced during census year from ore previously raised. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Beaver	750	.....	38,787	38,737	1,542	0,444	7,986
Juab	450	2,800	6,800	9,600	.....	.....	.....
Piute	50	.....	2,000	2,000	.....	.....	.....
Salt Lake	2,550	600	34,262	34,852	.....	.....	.....
Summit	3,845	.....	478,720	478,720	.....	139,518	139,518
Tooele	1,200	.....	16 660	16,600	.....	.....	.....
Utah	100	.....	5 000	5 000	.....	.....	.....
Washington	3,100	.....	73,989	73,989	.....	.....	.....
Total	12 145	3 400	858.158	659,558	1,542	145,962	147,504

RECENTLY, in order to test the capacity of the new circular saw at Port Blakely, a log 24 ft. long, and 7 ft. in diameter, containing over 6,000 ft. of lumber, was hauled into the mill, and soon ripped into inch boards. This, we believe, is the largest log in diameter ever sawed on Puget sound.—*Walla Walla Daily Union.*

IT is probable that a Signal Service station will be established at Cape Mendocino.

Italian Rocks and Contained Minerals.

Descriptive memoir of a collection of 200 specimens of Italian rocks and contained minerals, classified in stratigrapbical order, from tbe most ancient up to tbe more recent ones. Tbis series, made on tbe spot expressly for tbe State Mining Bnrean of California, by desire of the State Mineralogist, Mr. Henry G. Hanks, indicates with tbe utmost prscision, the topographical origin, and is divided in sucb a manner as to enable tbs student to refer to tbe antbor's works for more ample information on the snbjeot, viz.:

I Tesori Sotterranei dell'Italia, 3 vole., in 8 vo., ill., Tnrin, 1873-81.

Le Acque Minerali dell'Italia, 2 vols., in 8 vo., ill., with analyses, Tnrin, 1868-76.

The Mineral Resources of Central Italy, in Englisb, 1868, 1 vol., ill., containing descriptions of the mines and marbles (now becoming rare).

I Combustibili Minirali dell'Italia, Turin, 1879, 1 vol.

Dell 'Oro in Nativia (a full monograpb on gold), 1 vol., ill., Turin, 1881.

Tbe labels indicate: 1st. The orograpbical division. 2d. The bydrographical basins. 3d. The description nf eacb snmple, and the use to which they are pnt in the arts and manufactnres. 4tb. The uame of the townsbip from whicb the specimen was procnred. 5th. The mine of Ollomont. Ollomont (Tnrin). Val Pelline, Pennine Alps.

3792. Cbalcopyrites, from tbe copper lode in the cblorite schists. Ollomont copper mine. Ollomont (Turin). Val Pelline, Pennine Alps.

3793. Quartz, of somewbat greasy luster, accompanied by cbalcopyrites and pyrites from the copper lode. Ollomont mine. Ollomont (Turin). Val Pelline, Pennine Alps.

3794. Dark, dull-green cblorite scbist. Bobbio Pellice (Turin). Val Pellico, Cottian Alps.

3795. Pale, grayish-green cblorite schist, of somewhat silky luster. Val Tournanche, brancb of Val d'Aosta, Pennine Alps.

3796. Quartzose talo schist, consisting of pale-green talo and opaque wbite quartz. Donves (Turin). Val Pelline, Pennine Alps.

3797. Bluisb-gray calc schist. Pre Saint Didier (Turin). Val d'Aosta, Pennine Alps.

3798. Lead-gray foliated calc scbist. Gignod (Turin). Vallone del Gran Sen Bernardo, Pennine Alps.

3799. Chalcopyrites, witb gangue of milk-white qnartz, in cblorite scbists. Ollomont copper mine. Ollomont (Turin). Val Pelline, Pennine Alps.

3800. Pre-palœczoic group—Huronian system. Green serpentine schist, showing very distinctly tbe original stratification of tbe rock. Locana (Turin). Valle dell'Orco, Graien Alps. Used locally for rocfing instead of slnte or tiles.

3801. Grayisb-green and blackisb-green serpentine scbist, with perfect indication of original stratification. Bobbio Pellice (Turin). Val Pellice, Cottian Alps.

3802. Pale, bluisb-green compact serpentine schist. Bobbio Pellice (Turin). Val Pellice, Cottian Alps.

3803. Very dark bluisb-green serpentine, of nearly compact structnre. Bobbio Pellice (Turin). Val Pellice, Cottian Alps.

3804. Brownisb-green serpentine, containing the merest trace of bronzite. From the Monte Mussini, in tbe immediate vicinity to veins of magnesite and giobertite. Caselette (Turin). Val di Susa, Cottian Alps.

3805. Concretionary white giobertite (carbonate of magnesia); forms veins in the midst of serpentine, which is generally mncb decomposed in its proximity, and accompanied hy veins of eupbotide. Caselettc (Turin). Val di Susa, Cottian Alps. Used for chemical works and for making artificial mineral waters.

3806. Resinite, accompaying giobertite, and with it forming reticulated veins in serpentine. Caselette (Turin). Val di Susa, Collian Alps.

3807. Yellowish-brown decomposing serpentine, the rock in immediate contact with tbe reticulated veins of giobertite and resinite. Derived from tbe hard form of serpentine (No. 3804 above) and traversed by veins of euphotide. Caselette (Turin). Val di Suee, Cottian Alps.

3808. Snow-white sepiolite, or Meerschaum; accompaniee giohertite. Caselette (Turin). Val di Susa, Cottian Alps.

3809. Brownisb-white resinite, showing contact witb yellowish-brown decomposing serpentine. Caselette (Turin). Val di Susa, Cottian Alps.

3810. Compact porcelain-wbite, semi-opal, accompanying resinite. From the Mussine, Caselette (Turin). Val di Suse, Cottian Alps.

3811. Resinite of geletinous appearanoe, sbowing the passage into opaque-white, semi-opal at eitber side of tbe concretion. Caselette (Turin). Val di Susa, Cottien Alps.

3812. Opaque, grayish-white, semi-opal accompanying the reticnlated veins of giobertite and resinite. From the Mussine. Caselette (Turin). Val di Susa, Cottian Alps.

(TO BE CONTINUED.)

Gravel Channels.

The Blind Miner's Theory.

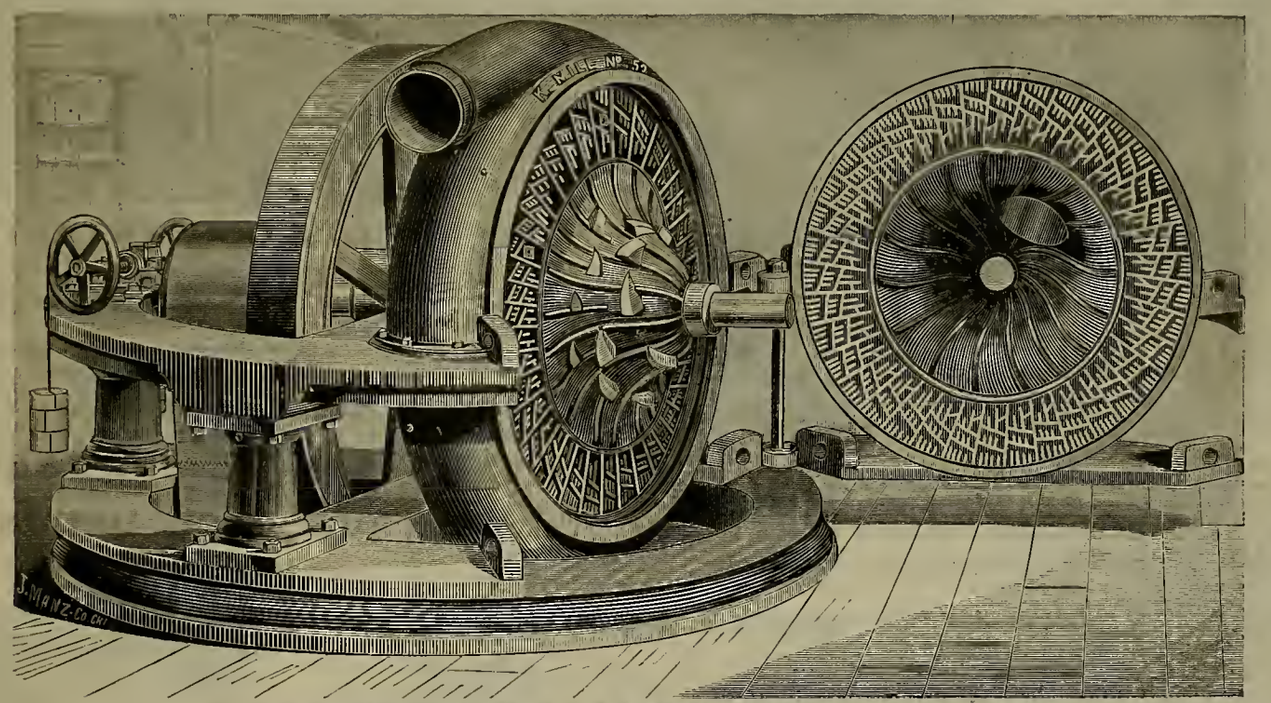
EDITORS PRESS:—I have always looked upon the editor of the Nevada *Transcript* as a friend, and do not believe now tbat be would willfully pnblish a lie to injure me, mnch less to injure tbe cause of our prosperity; bnt let all nnderstand tbat I am able to speak for myself, and defend anytbing I olaim to understand against any man, and I defy any man in tbis State to prove against me that tbere ever was any *lead* that wonld pay in a gravel obannel that oarried volume of water enough to handle its gravel. I don't consider 54 years an extremely old man. My motber was 30 years older tban tbat when she died, and my father lived more tban bis allotted days. Now, yon see tbere bave been elements at work to make it a hard road for me to travel, and means resorted to tbat an bonorable man wonld not only call mean, bnt disbonest. I bave been robbed of every dollar of my money throngh intri and rascality, and tbe parties would like to justify tbemselves by villifying me, and tbere seems to be a feeling in the public mind that all discoveries tbat would benefit mankind, that cannot be patented of rigbt, are pnblic property, and ought to be demanded without the least guarantee of reward to tbe discoverer, no matter how mncb hard work and stndy it every offer that a man could make to get help, and they say that tbey bave spent over $50,000 in tbat time in this bill by guess, and tbey bave only snceeded in convincing themselves that I was right in tbe first place, that tbere was no cbannel in tbe middle of the bill.

Now, tbere are nine deposits in tbe Alta channel yet undistnrbed in tbis hill, neither more nor less, and I could bave taken $5,000 in tbe start and opened every one of tbem, without a doller of assessments, and prodnce over $2,000,000 wortb of mines; snd I can take $1,000 now and prove a discovery that wonld bring greater prosperity to California tban ever tbe miners saw witbout it. This is entirely a drift mining advantage, hut even bydranlic mines wonld be immensely benefited by tbe knowledge, and as soon as I can possibly do jnstice to myself and family, I will teacb tbe public more about gravel mining than tbey ever dreamed of knowing, and set pbysical geology on a new basis, sn they can rapidly clear up tbe gross blunders tbey are now making. How much tbis discovery will benefit mankind outside of mining, is beyond the ken of man, but remember, it is not an easy problem to master wbat has puzzled the world so long, and it will take time and study to nnderstand it, and the best of philosophers to practice it. Now, I tbink you sbonld pnblisb this as my defense.

H. CLENDENEN.

Randolph Flat, April 10, 1882.

AT tbe Tombstone mine tbey are pushing



VIEW SHOWING GRINDING FACES OF NORTHWESTERN FERTILIZING COMPANY'S ORE MILL.

name of tbe province (between parentbeses). 6tb. Tbe geological age, according to the new nomenclatnre, decided npon by the Geological Congress at Bologna, in 1881.

Alpine Region.

3784. Primary crystalline rocks.—Gray granite, poor in mnscovite, from tbe Monte Bianco, the bigbest monntain in Enrope (4,810 meters), Conrmayenr (Tnrin). Val. d'Aosta, Pennine Alps.

3785. Greenish-gray granite, containing vitreous and opaqne-white quartz a large amount of greenish-gray felspar, and minute scales of mnscovite; from the Monte Bianco, Conrmayeur (Turin). Val d'Aosta, Pennine Alps.

3786. White and black granite; from Mont' Orfano, Mergozzo (Novara), Val. d'Ossola, Lepontine Alps. Tbis beautiful granite contains small scales of bleckish muscovite, speringly distribnted in tbe midst of white felspar, scarcely to be dietingnisbed at a sbort distance from the quartz associated witb it. It is much used for paving cities (Milan, etc.); also as an ornamental building stone, and is much esteemed on account of its durability.

3787. Pink granite, containing pink felspar of large crystalline structnre, white quartz and small crystels of blackisb-brown muscovite. Gignesa (Novara). Lago Maggiore, Lepontine Alps. Thie is a splendid ornamental building stone, mnob prized, tbongb little employed, being too expensive for general use.

3788. Fine-grained, black and gray granite, wbich passes into eyenite by containing hornblende. From near tbe lodes of magnetic iron, Traversella iron mines. Traverselle (Turin), Val Chiusella, Graian Alps.

3789. Pre-palœzoic, metamorpbic sedimentary rooke in general. Dark, dull-green chlorite schist. Etronbles (Turin). Vallone del Gran, San Bernardo, Pennine Alps.

3790. Dark, grayish-green cblorite scbist, enclosing the lode of copper pyrites and pyrites. Copper mine of Ollomont. Ollomont (Turin). Val Pelline, Pennine Alps.

3791. Finely crystalline pyrites, forming veins without definite walls, togetber witb copper pyrites, in the midst of cblorite schist. Copper bas cost bim. I bave never run 5,000 ft. of tnnnel in my claim, nor bave I worked without a prospect tbat I wonld sbow any miner (if he were a miner), the prospect was good. I have tbree deposits on my claim ("positives"), and I base tbeir value upon tbe estimated value upon the two next deposits above them that have been taken out; that would be abont $20,000,000, if I wonld add tbe lies, and a little over $200,000 each if they were sifted out. I am right on tbe Alta lead, between two deposits, and bave got as high as 16 cents to the pan, and that is a rich lead. It is abont 30 ft. wide, but too thin to drift ont.

I bad in tbe beginning about 500 ft. to run either way to reach a deposit. I was in tbe channel 700 ft. from the month of an old tunnel without a dollar, and subject to the whime of my partners. I have rnn about 2,400 ft. of tnnnel and the smallest cayote-holes, and I am now abont 450 ft. from wbere I started. Before I could reach one deposit, I was forced by my partners to go after the other, against my solemn protest; and wben I reached its locality, we were 18 ft. too higb. I have not been able to work more than half tbe time, I bave owned the claim, and I have done all this work nnder circnmstances tbat would bave disbeartened a mule. I have run twice to tbe surface for air 650 ft., and bnndreds of ft. on acconnt of bad surveying. I have never had $50 at a time to belp myself in the mine since I commenced. My partners have worked on peoples sympathy for me to borrow money for themselves, on the pretense of helping me in my mine, and at tbe same time were not ebowing one dollar in twenty. Nearly all of tbe work has been done hy myself, a boy, and a Chinaman; and there bas not been 500 ft. rnn that will not benefit the mine; and no man could go straigbter to the deposit than I have been going.

I live 3 miles from Grass Valley and I walked tbere 28 times, to get $200 eubscribed in $20 shares in my mine, and no assessments to belp me. Then I walked tbere over 20 times to collect it, and I bave not got it all yet; and I was most rascally need in my tunnel, in working it out. Now I have done everytbing and made tbe incline air shaft at tbe Combination mine down into tbe ore regions as rapidly as possible, and it is looking splendid. This ore body bas been an exceedingly large and interesting one. Tbe dimensions thus far explored are 530 ft. long, by 140 ft. wide. This includes tbat portion belonging to the Vizine company. The Tombstone company has extracted from its ground up to date, 11,000 tons, and the Vizina about 6,000, making an aggregate of 17,000. The gross value of tbis bonanza bas not been less than $1,250,000. This puts the yield per ton below what is well known much of it returned. Tbe ontlook for a continuation of tbis body in the Tombstone company's gronnd is still good for thousands of tons.

A NEW MINERS' UNION.—The miners in Aurora have organized themselves into a union and elected tbe following officers: H. V. Poor, President; D. Perrier, Vice President; J. L. Scott, Recording Secretary; Chas. F. Quimby, Financial Secretary; Roland H. Cutts, Treasnrer; Eugene Godat, Conductor; J. F. Gillis, Warden. The object is to keep wages at $4 per day for underground miners.

THE Utab Commiseion provided for in the Anti-Polygamy bill will be appointed by the President some time in April. The Commission will eet out eoon after its organization in Wasbington. It is now estimated thet six monthe will be required for the Commission to perform its work and perfect the machinery for the government of the Territory.

THE Contention mine, at Tombstone, wbich yielded over $170,000 last month, had a yield per ton, estimating 2½ tons crushed per day per stamp, wbich will not be far out of tbe way, is $82.84, being ahout the fignres for the first year's work.

IF the statements of tbose who ought to know are correct, the appropriations which are to he reported in the River and Herber bill will be the most extraordinary ever made. Tbey will reacb $15,000,000.

CHICAGO **FRASER & CHALMERS,** ILLINOIS,

MANUFACTURERS OF IMPROVED AND APPROVED FORMS OF

MILL AND MINE MACHINERY.

Having made extensive additions to our Shops and Machinery, we have now the LARGEST and BEST APPOINTED SHOPS in the West. We are prepared to build from the Latest and Most Approved Patterns,

QUARTZ MILLS

For working gold and silver ores by wet or dry crushing. The Stetefeldt, Howell's Improved White, Bruntou's & Bruckner Furnaces, for working base ores. Rotary Dryers, Stetefeldt Improved Dry Kiln Furnaces.

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Water Jackets, either Wrought or cast iron, made in sections or one piece, either round, oblong, oval or square. Our patterns most extensive in use. SPECIAL FURNACES FOR COPPER SMELTING. Slag Pots and Cars, improved form. Bullion and Copper Moulds and Ladles, Litharge Cars and Pots, Cupel Furnaces and Cars.

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Large or Small for flat or round rope. Double Cylinder Engines, from 6x10 to 18x60. This latter size furnished J. B. Haggin for Giant and Old Abe Co., Black Hills also Corliss Pumping Engines, 26x60, for Hoisting and Pumping Works, for 2,000 feet deep. **Baby Hoists for Prospecting, 4 H. P. to 6 H. P.**

Wire Rope, Safety Cages and any Size and Forms of Cars. **McCaskell's Patent Car Wheels and Axles—Best in Use.**

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Coarse Concentrating Works, Improved Jigs, Crushing Rollers, Sizers, Trommels, Rittenger Tables, and all other adjuncts for the proper working of Gold, Silver and Copper Ores, complete in every detail.

HALLIDIE IMPROVED ORE TRAMWAYS. We refer to Gen. Custer mine, Idaho, 5,000 feet long; Columbus Mine, Col., 4,750 feet long; Mary Murphy mine, Col., 5,000 feet long, all in constant operation.

LEACHING MILLS,

Improved Corliss and Plain Slide Valve Meyer's Cut-off Engines.

CORLISS ENGINES from 12x36 Cylinders to 30x60. PLAIN SLIDE VALVES from 6x10 to 36x36. BOILERS of every form, made of Pine Iron Works C. H. No. 1 Flange Iron, or Otis Steel. Workmanship the most careful. All Rivets Hand Driven.

HERCULES SLAYING THE GIANTS.

HERCULES POWDER

Derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

No. 1 (XX) is the Strongest Explosive Known.

No. 2 is superior to any powder of that grade

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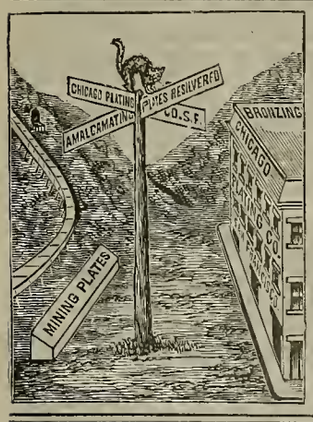

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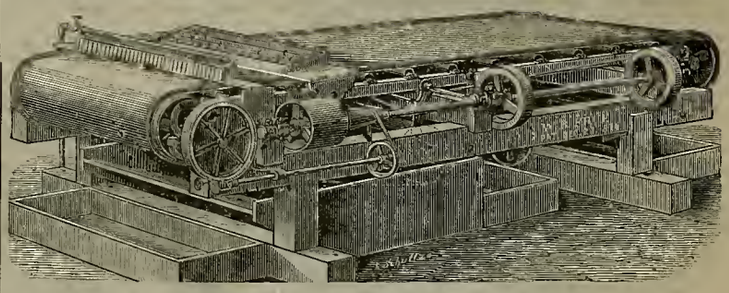

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Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.

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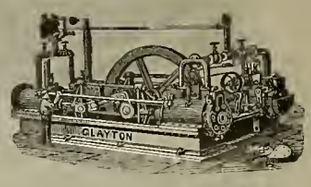
—AND—

INGERSOLL ROCK DRILLS.

INGERSOLL ROCK DRILL.



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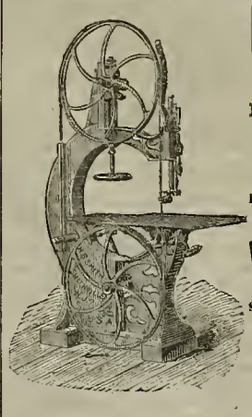
Sole Agent for the Ingersoll Rock Drill and Clayton Compressor Co.



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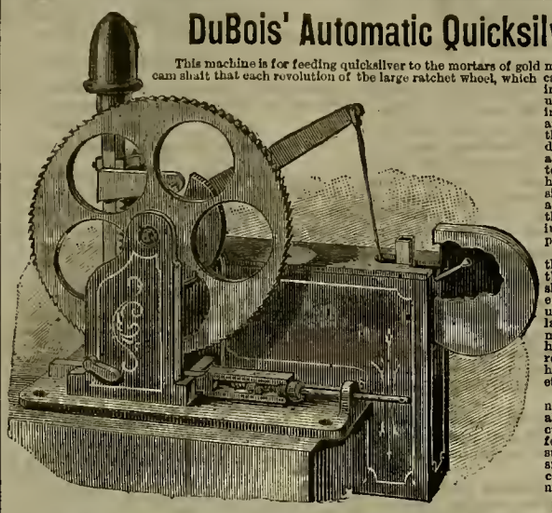
This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING APRIL 4, 1882.

255,918—FAUCET FOR REGULATING OVERFLOW FROM BASIN—F. A. Bishop, S. F.
255,838—BUCKLE—Alex. Cadwell, Petalums, Cal.
255,935—ORE CRUSHER—A. N. Cameroo, Greenville, Cal.
255,773—CURTAIN BRACKET—H. C. Clemeot, Albany, Oregon.
255,855—CHILD'S CARRIAGE—Adam Heim, S. F.
255,990—PUMP—Wm. D. Hooker, Oakland, Cal.
255 876—CUFF BUTTON—David Luhin, Sacramento, Cal.
255,802—NUT AND BOLT LOCK—B. Marks, Fresno, Cal.
255 882—CHECK FOR HORSES—M. M. Nathanson, S. F.
255,887—HAY-STACKING APPARATUS—Gamos Richardson, San Jose, Cal.
255,888—DUMPING CAR—I. B. Rehhins, Stockton, Cal.
255,894—VINEYARD PLOW—A. C. Taylor, S. F.
256,079—SHACKLE—J. M. Trackwell, Skookumchuck, W. T.
255 842—TUYERE—James E. Day, S. F.
255,900—CUSHION PROTECTOR FOR BOTTLES—James M. Thorpe, San Jose, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

CUSHION PROTECTOR FOR BOTTLES.—James M. Thorpe, San Jose. No. 255,900. Dated April 4, 1882. This bottle protector belongs to that class wherein the bottle or vessel is surrounded by a rubber band or cord resting in a groove. Heretofore in this class of protectors, bottles have been made with the groove for containing the rubber cushion in the same relative position. By this construction, when the bottles are packed, the packing rings of contiguous bottles abut against each other, and the two bottles would be separated by the projecting portions of two packing rings, thus occupying much more space than is necessary. The object of this invention of Mr. Thorpe's is to overcome this objection, and it consists in a bottle provided with a series of grooves or bolding devices near its upper end, and a series of the same near its lower end, in combination with adjustable elastic packing rings, whereby the inventor is enabled to readily place the packing rings on contiguous bottles at varying elevations, so that they will not abut against each other.

TUYERE.—J. E. Day, assignor of half to J. C. Aitken, San Francisco. Dated April 4, 1882. No. 255,842. This new tuyere is for forges. It consists in the construction and arrangement of the air-pipe, in connection with a peculiar, removable protecting casting, fitting upon said pipe and receiving the fire upon itself, said casting being provided with a removable grate immediately over the ventilating hole in the pipe below. The main object of this invention may be explained by noticing the present construction of forges with the tuyeres generally in use. Any pipe which can be made to conduct air to the fire may be regarded as a tuyere; and in many cases the only tuyere used is a piece of pipe with a few holes cut in its top, directly under where the fire is built. The objection to this is that, the fire being built upon the pipe, it not only soon clogs up, but will burn out in a short while and become useless. The object of this invention of Mr. Day is to provide an inexpensive tuyere made of a piece of pipe, in which the ventilation will be good, and which will be protected from burning out.

HAY STACKING APPARATUS.—Gamos Richardson, San Jose, Santa Clara county. No. 255,887. Dated April 4, 1882. This invention relates to an improved apparatus for stacking hay in the field, and it consists of a framework which is set up on one edge, so as to stand upright, and it is provided with suitable grips or braces to hold it up, and also with pulleys, over which two or more ropes lead, to attach to the nettings on which the hay is placed, passing thence to guide pulleys, and to the horses or power by which they are operated. In combination with the frames, nettings and ropes, the inventor employs ways or guides, over which the nettings, with their load, may be elevated to the top of the stack without rolling devices or any other means for preventing contact, and without a direct lift.

BUCKLE.—Alexander Cadwell, Petalnma. No. 255,838, Dated April 4, 1882. This invention relates to a new and useful buckle, of the kind having tongues, and commonly known as "tongue buckles," and it consists in curving inwardly the point of the tongue, and providing a hole or socket in the end of the buckle frame into which the inturned or curved head of the tongue is adapted to fit, after passing through the hole in the strap. The object of this construction is to afford greater security in buckling. The tongue, being thus held in the hole of the buckle, will prevent the strap from slipping off of it.

VINEYARD PLOW. — A. C. Taylor, S. F. No. 255,898. Dated April 4, 1882. The improvement which this patent covers is specially applicable to what are known as "vineyard plows." The improvement consists in the construction of a plow having the lower portion of the share and mold board made stationary, while the upper portion is hinged in front, so that it may swing outward, and stand in the same curve with the front of the mold board, or it may swing back beneath the beam and not turn a furrow, but will allow the earth, which has been lifted by the plow, to fall back into the furrow again. The beam swings upon a vertical pivot, so as to throw the plow to or from the land in the ordinary manner.

CHECK FOR HORSES.—Martin M. Nathanson, S. F. No. 255,882. Dated April 4, 1882. This check for horses consists of a peculiar strap adapted to fit over the nostrils of a horse, with means of tightening the same when desired. It further consists of a lever and cord, or strap attached to said nose strap, by means of which the nose strap may be tightened from a vehicle to which the horse is harnessed. A brake attachment to the vehicle, working in connection with this check, has been devised.

News in Brief.

THERE is a severe famine in Zululand. Crops have failed because of the drouth.

THE Rev. Charles Wadsworth, who died in Philadelphia April 1st, was well known in this city as former pastor of Calvary Presbyterian Church.

THE Union Pacific Railroad Company's financial balance sheet for the past year shows an excess of receipts over expenditures of $13,111,153.

GUITEAU has sold to a circus manager the suit of clothes he wore when he shot President Garfield, and a sculptor is making a bust of the assassin.

IT is understood that the Secretary of War recommends four or five months' guard-house confinement for Sergeant Mason, with the forfeiture of pay, and dishonorable discharge.

OUR importations of iron and steel, cutlery, machinery, firearms, tools, saws, hardware and other manufactures of these materials amounted last year to $46,668,171, against $63,963,252 for the previous year.

THE American Board of Foreign Missions at Bonter, has been advised by cable from Constantinople that in a region of Turkey, three times as large as Massachusetts, the people are starving by reason of the ravages of locusts. An urgent appeal for succor is made.

JUMBO, the big elephant from London, has been safely landed at New York. As soon as he touched American soil he was treated to a quart of whisky, which he swallowed with a satisfaction becoming any tosper. Jumbo conducted himself most appropriately upon the voyage.

ACCORDING to the New York *Sun*, there is a perceptible slackening in the demand for railroad materials. The steel-rail mills have plenty of orders, and the locomotive works have not yet begun discharging men; but locomotives which a year ago were worth $15,000 are now to be had for $12,000.

A LARGE force of workmen are engaged at Indio, a station on the desert, about half way between Los Angeles and Yuma, putting up an eating house, a hunk house for employes, and a roundhouse with six locomotive stalls. Indio is to be made the end of a freight division, and will no doubt prove a great relief to railroad men.

STAHLSCHMIDT and Ward report that the British steamship *Euphrates*, 1,716 tons, the British ship *Escombia*, 1,957 tons, the ship *Blue Jacket*, and the ship *W. J. Roteh* sailed about ten days ago from Hongkong. The steamship has between 2,000 and 2,500 Chinese, and the ships about 1,000 more. The steamship is due this month. The Chinese are intended for railway work, and other shiploads will follow.

J. A. Richardson, agent of the California Fish Commissioners, arrived in Truckee Saturday morning with 12,000 young trout for distribution in Prosser creek, two miles from that place. Six thousand were Eastern trout, 3,000 McCloud and 1,000 land-locked salmon. These fish are about one month old, and when placed in the creek were in a fine condition. Richardson has also sent 6,000 Eastern front and land-locked salmon to Nevada City, for distribution there.

IT is said that Charles Crocker is contemplating the erection of a magnificent art edifice on his property on the north side of Post street, between Kearny and Dupont. The building is to be five stories in hight, the two upper stories to be rented to artists, and the ground floor to be used as stores, while the remainder of the building will be made the home of the Art Association, Society of Decorative Art, and other art societies.

THE Eastern Railway Company of France has just made a new essay in the application of electricity. A train equipped with the most recent and improved electrical apparatus proceeded from Paris to Gretz. The carriages were connected by electric communications, the brakes acted by electricity, and all the compartments of the thirteen carriages composing the train were lighted by electric lamps. The results of the experiments were completely satisfactory.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired), be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

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OAKDALE, Stanislaus Co., Cal., March 6, 1882.

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Yours Truly, J. M. NELSON.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. McGREW—Santa Clara county.
M. P OWEN—Santa Cruz county.
B. W. CROWELL, San Benito and Monterey counties.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARMD C. HOAG—California.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

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BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central system in San Francisco.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

ANNUAL STATISTICIAN of 1882.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 502 Taylor st. Price, $4.

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Mining and Other Companies.
Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Bullion Mining Company.—Location of Principal place of business, San Francisco, California. Location of works, Gold Hill Mining District, Storey county, Nevada.
Notice is hereby given, that at a meeting of the Board of Directors, held on the 29th day of March, 1882, an assessment (No. 23) of Thirty (30c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 3, Safe Deposit Building, 328 Montgomery street, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the second (2d) day of May, 1882, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the twenty-fourth (24th) day of May, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.
J. M. BRAZELL, Secretary.
Office—Room 3, Safe Deposit Building, No. 328 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.
OFFICE OF THE
SILVER KING MINING COMPANY,
San Francisco, April 4, 1882.
At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 28), of Twenty-five Cents (25c) per share was declared, payable Saturday, April 15, 1882, at the office of the Company, Room 19, No. 328 Montgomery street, San Francisco, Cal. Transfer books will be closed on April 10, 1882, at 1 P. M. JOSEPH NASH, Sec'y.

DIVIDEND NOTICE.
OFFICE OF THE
Northern Belle Mill and Mining Company,
San Francisco, April 10, 1882.
At a meeting of the Board of Directors of the above-named Company, held this day, dividend No. 02 of Fifty cents (50c) per share, was declared payable on Saturday, April 15, 1882. Transfer books closed on Tuesday, April 11, 1882, at 3 o'clock P. M.
WM. WILLIS, Sec'y.
Office—Room No. 29, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.
OFFICE OF THE
Standard Consolidated Mining Company.
San Francisco, April 1, 1882.
At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 40, of seventy-five cents (75c) per share was declared, payable on Wednesday, April 13, 1882, at the office in this city, or at the Farmers' Loan and Trust Company, in New York. WM. WILLIS, Secretary.
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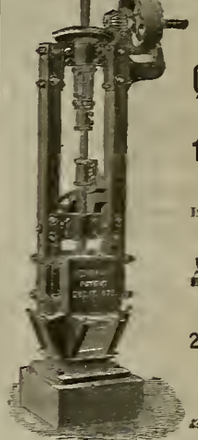
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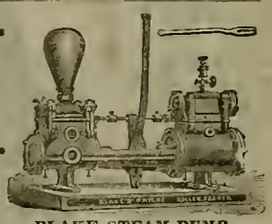

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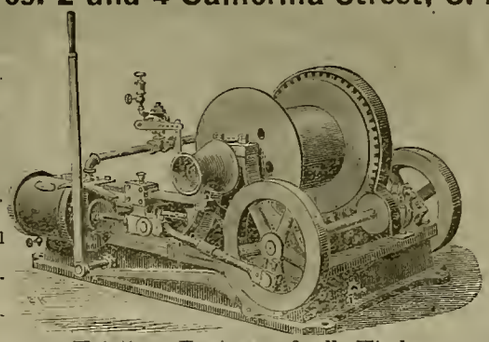

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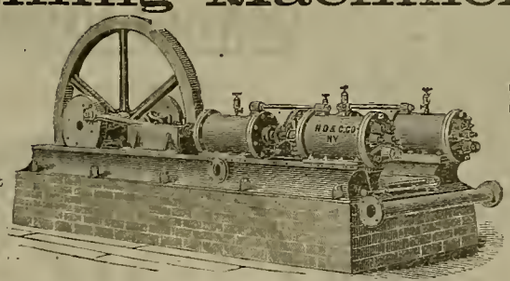

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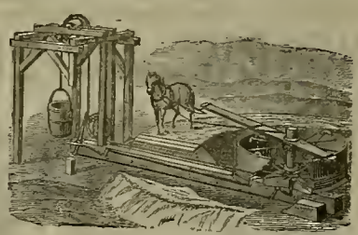

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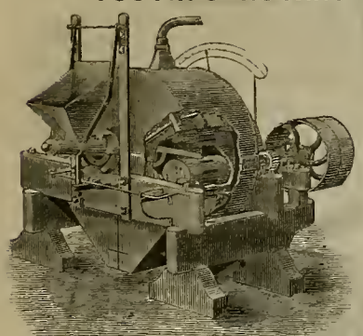

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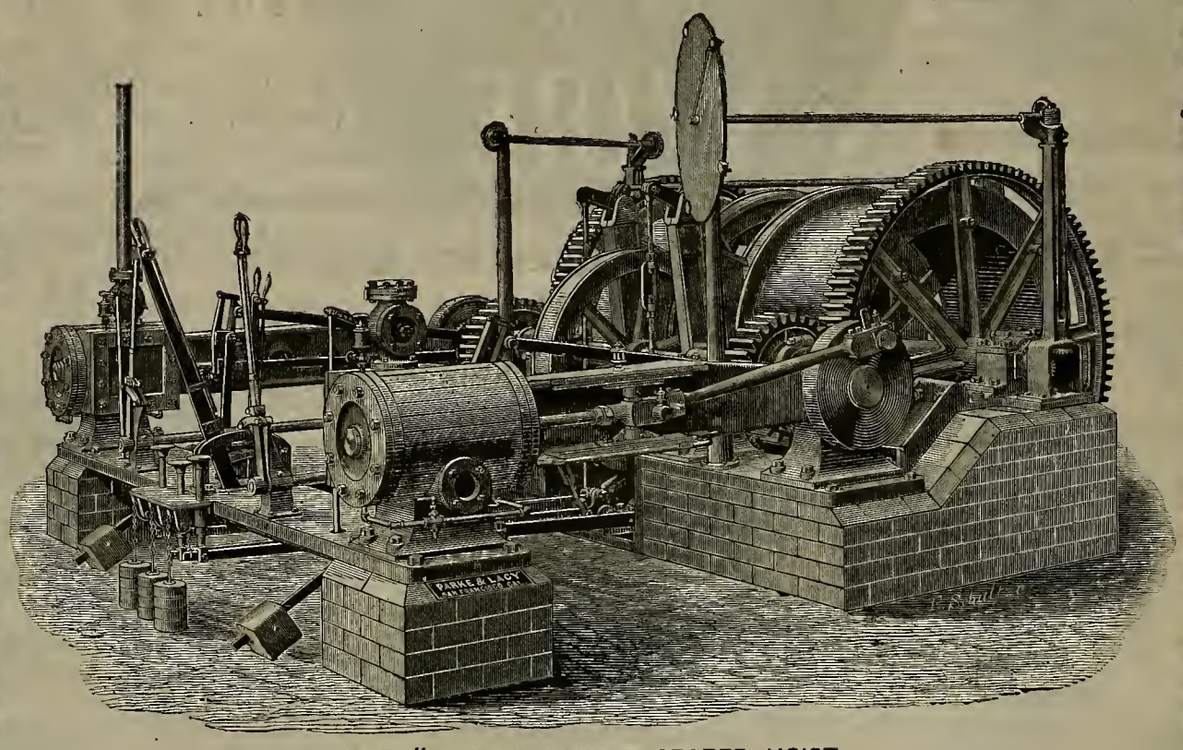

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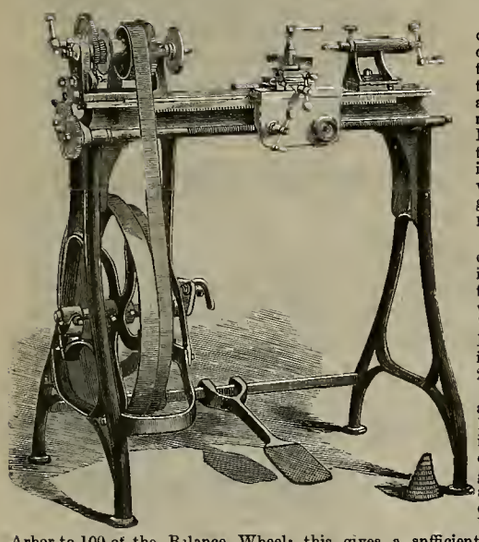
SCREW CUTTING LATHE.



This cut represents a new screw cutting Foot Lathe which was put on the market about two years ago to meet the demand for a first-class tool at a low price, which will do a great variety of work, both in metal and wood, and is the best Lathe made, considering its capacity and price. The cut gives a good idea of its appearance, and below we give dimensions of parts and general description.

Description of Lathe, 4 ft. Bed.

The Lathe occupies a floor space of 28 by 48 inches, the centers being 44 inches high from the floor; the bed is 48 inches long, 6½ inches wide, 5½ inches deep, with double Vs. for Carriage and Tail Stock. It swings 10 inches over bed and 6 inches over carriage, and will turn 26 inches long.

The Head Stock is back geared, and the Cone has three speeds for 1¾ inch belt, the smallest being 3 inches diameter, the larger 6 inches diameter; this, with the back gears gives six different speeds, the fastest giving about 1,000 revolutions of the Arbor to 100 of the Balance Wheel; and the slowest, 75 of the Arbor to 100 of the Balance Wheel; this gives a sufficient range for all kinds of work.

The Arbor in Head Stock has a ⅝ inch hole through it, which is very convenient for turning the ends of long rods, making small screws, studs, &c. The Centres are ½ inch diameter. There is an attachment in Head Stock for reversing the motion of Carriage.

The carriage has a rack and pinion for moving it by hand, and a split nut moved by a cam on the face of Carriage to throw it in gear with screw; the reversing motion is in Head Stock.

The Tool Post has a slot for tools ⅝x1¼ inchss; the tool is adjusted by a wedge made on the arc of a circle and fitted to a convex washer. The leading screw runs the whole length of Lathe, and has 10 threads to the inch. A set of gears go with the lathe which will cut all common threads and a great variety of othsr sizss by compounding them; there is a screw stop on the Carriage for screw cutting, &c.

The Tail Stock can be set over for turning tapers, &c. The spindle of Tail Stock is 1 1-16 inches diameter, and has a motion of 3 inches. The center is fitted to a taper hole, which is the method adopted by all the best makers, and is the same size as the one in Head Stock, so that chucks and other tools fitted to one can be used in the other.

The Foot Motion, we consider the best made, the crank is adjustable and the shaft has swivel bearings; the balance wheel is 22 inches diameter and has 3 speeds to match Cone on Head Stock.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, APRIL 22, 1882.

VOLUME XLIV Number 16

California and Mexican Mines.

If a correct list was made of the gold quartz mines in Calaveras, Amador, Tuolumne and other mining counties that are now idle, or not being worked, our mining community would be greatly astonished at their number. It is not, however, from the want of merit in the mines, as any one of those who have now been engaged in quartz mining in this State for the past 30 years will tell you; and as to the working of low-grade ore, we surely can do as well as they are doing in Australia, where $5 rock is made to pay handsomely; and we really believe, though we do not like to think so, that if the same mines were situated in Mexico, that a large proportion of them would very soon be purchased, or arrangements made for working them. Particularly if the same mode of testing was used here as applied there, the results no doubt would be equally good. We have always done all in our power to assist and further legitimate mining everywhere, but particularly in California, and we flatter ourselves we have accomplished a great deal. One of our oldest subscribers, who has been extensively engaged in mining here for the past 29 years, remarked to us the other day, that we had done more to advance legitimate mining than any other paper published in this State.

We have nothing to say against the investment in Mexican mines; on the contrary; but we should very much like to see some of the money spent in our own mines, and in the employment of our own miners, instead of Mexican's, who, like the Chinese, neither regard us or our institutions with favor.

In the *Mining Magazine*, New York, 1861, is an article on the "Historical and General Notes upon the Silver Mines of Mexico," wherein it says: "In 1827, such was the rage for Mexican mines in England that they were bought before being examined by the company's agents in Mexico; that £3 000 000 sterling was invested in the mines; that the practical experience of the native miners was underrated, their machinery condemned without any previous inquiry as to its powers, or the different degrees of perfection which it had attained in different districts. Gradual improvement was pronounced too sluggish a process, and Cornwall was drained of half its population in order to substitute an entirely new method for that which had been endeared to the Mexicans by the experience of three centuries. The total failure of this attempt was the natural consequence, and many of the boasted improvements introduced from Cornwall had not been productive of any solid advantage, while many were complete failures."

The average Mexican miner has acquired a practical knowledge, so that he can distinguish the different kinds of silver and copper ores, and also to know their value; whereas it will take our Californian a long time to gain the same information. With regard to gold, their rude tests with a wooden vessel, or *batea*, which few of our miners can use, is, to say the least of it, a very safe one. The horn-spoon, from all the information we can obtain, is mostly used for testing the different stages in the amalgamation process of silver.

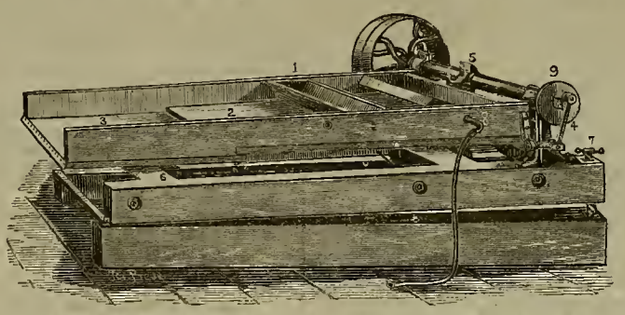
There are a number of mines in California that have not been worked for the past eight or ten years, the owners vainly trying to place them at very high figures on the Eastern market, relying on the report of some expert to effect that purpose. The best report, after all, is a working test, say of 20 or 30 tons, taken from different points where the vein is well developed, and such test to be made under the guidance and direction of a competent practical miner.

THE unjust law requiring foreign mining companies doing business in Massachusetts to pay a tax of one-tenth of one per cent. upon their capitalization has been repealed by the Legislature. Under the new law recently passed and approved by the Governor, the tax is reduced to one-fortieth of one per cent., no company to be liable for over $300 per annum.

An Improved Tuyere.

We made, the other day, a brief note concerning a recently patented tuyere invented by Jeremiah Day. As it is something of considerable interest, we now give an engraving showing the device and describe it more fully. The object of this invention is to provide an inexpensive tuyere, made of a piece of pipe, in which the ventilation will be good, and which will be prevented from burning out.

The engraving shows the tuyere with the removable protecting casting and the grate. The pipe is preferably a common gas-pipe, led upon the forge from a common bellows or blower, in the usual way. The end is made air-tight by a screw cap, adapted to be removed to clean the pipe.



PATTEN'S ROCKING AND PERCUSSION CONCENTRATOR.

In the pipe upon its upper side is made an aperture over which the casting fits. This casting is made just large enough to fit snugly over the pipe, and is made with a convex top, and is therefore thicker at the middle than at the ends. It is provided with a central aperture or grate-opening, which, when the casting is fitted in the pipe, is directly over the opening in said pipe.

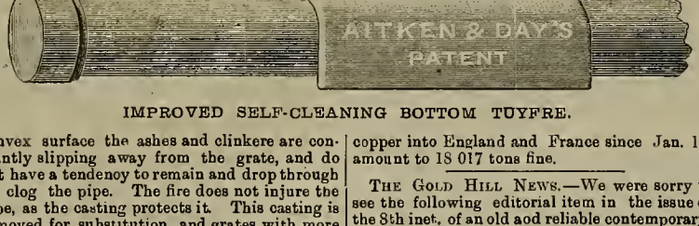
The grate (shown in the small cuts) is adapted to fit closely in the grate-opening, and has any suitable number of bars. The fire is built upon the grate and casting, and on account of the convex surface the ashes and clinkers are constantly slipping away from the grate, and do not have a tendency to remain and drop through to clog the pipe. The fire does not injure the pipe, as the casting protects it. This casting is removed for substitution, and grates with more or less opening to give more or less draft, according to nature of work.

A point of advantage is also in extending the air-pipe beyond the fire and closing its end. The air, when forced into the pipe, reaches its whole extent and keeps that portion of the pipe beyond the fire cool. It acts as an air-chamber to increase the draft through the opening and keeps up a circulation, thus preventing the pipe from becoming as hot as it would were the end to remain in the fire and the air escape therefrom. It also allows greater space for the small coals which drop through the grate to congregate before being blown out; and, lastly, it allows the cleaning to be done easily, for by removing the cap the pipe may be blown out and thoroughly cleaned.

This tuyere is easily connected by merely putting it over the nozzle of the bellows or blast-pipe. It is ready for use. There is no water, no slide, no bolts, no crank and no rod. It will never burn out or choke up, and is the only tuyere suitable for general blacksmithing for bellows or blowers. The castings will be sold alone by the patentees, Aitken & Day, 44 and 46 Main street, in this city, and the user can procure his own pipe. A beauty of this tuyere is that it will keep the fire from spreading all over the forge. The castings for the smallest size only cost $1, and those for No. 4—the largest size—cost $3.50. The whole thing, of the largest size, costs but $6.

If running with a blower, and the engine should break down, it is not necessary to disconnect, but the nozzle of a bellows or portable blower may be put in the end where the cap is, and work can go on. This cannot be done with other tuyeres. The patent right for this device is for sale.

COPPER.—A reduction of quotations for English manufactured copper of £2 per ton was announced by the Associated Smelters on March 31, but on the 7th a sudden advance to £64 10s for spot and £65 6s for three months' parcels took place. On the 10th, there was a slight reaction, and then the market went up and down till the 27th, when it declined a little. Quotations in Liverpool on the 1st, and according to James Lewis & Co.'s circular, were as follows: Chile bars, good ordinary brands, spot, £64 5s and £65 5s with three months prompt; ore, 13s 3d; and regulus, 13s 6d per unit. Chile exports to March 24th are 12,220 tons fine. The total visible supply of copper is now 51,843 tons fine against 54,190 tons on March 1st. Imports of copper into England and France since Jan. 1st amount to 18 017 tons fine.



IMPROVED SELF-CLEANING BOTTOM TUYERE.

THE GOLD HILL NEWS.—We were sorry to see the following editorial item in the issue of the 8th inst. of an old and reliable contemporary, the Gold Hill *News*.—"Owing to the great depression in business interests of this town, the stagnation of mining industries in this district, and unfavorable prospects for the near future, the News Publishing Company has decided to suspend further publication of the Gold Hill *Daily News*, until July next."

SIX MILLION pounds of plumbago are annually imported into the United States, and it is estimated that the home production in New York, Pennsylvania, Canada, and elsewhere equals this amount. This valuable material is used principally in the manufacture of lead-pencils, stove polish and crucibles. Its market price varies, according to quality, from $25 to $75 per ton.

THERE is a general strike among almost all classes of laborers at Toronto, Canada. Probably not less than 2,000 workmen are engaged in it. The strike is driving business to Western towns.

The Patten Concentrator.

We illustrate on this page C. W. Patten's concentrator—a new device in this line. By referring to the cut, the figures indicate the parts as follows:

1. Hopper for receipt of pulp; 2. Pan or separating portion of table; 3. Tailings discharge. (The opposite end is concentration or sulphuret discharge.); 4. Crank flange and rocking connection; 5. Cam to produce lateral motion and percussion; 6. Bottom frame; 7. Screws to regulate inclination of table; 8. Distributing or wash water pipe; 9. Standard and driving shaft.

This machine may be described as combining the rocking and percussion motion, which allows it to be set up with the pulp or gangue discharge end highest, which is the reverse to other concentrators; and by this means it is less liable to carry off the mineral with the gangue. By the peculiar construction of the concentrating table, and the combination of the principles and motions of the rocker, pan and percussion table, it is claimed that this concentrator will work more tailings closer and cleaner than any heretofore in use, and, by amalgamating or silver plating a portion of the copper bottom and keeping a little free quicksilver in the pan of the table, it will catch and hold all floured quicksilver, amalgam and free metal that may escape from the battery and plates. The wear and tear is nominal and the construction simple. Mr. F. A. Huntington, the manufacturer, at 220 Fremont street, in this city, where one may be seen in operation, says one machine will concentrate the tailings from a five-stamp battery, and that it will save enough to pay for itself ($300) in a very short time.

All Hands Discouraged.

A reporter of the Eureka *Sentinel* had an interview on Sunday with a gentleman from San Francisco, who visited the Comstock before coming to Eureka. He has dealt in stocks, and is intimate with leading operators at the Bay. In reply to a question as to what he thought of the Comstock situation, he said: "The outlook is very gloomy. During my visit to Virginia city, I had a talk with a number of prominent men, and they feel very much discouraged. The situation in the south end mines—Overman, Belcher, Crown Point, Jacket and Imperial—as well as in some of the middle group, is extremely critical. It is doubtful if any more assessments can be levied and collected on these properties. The price of these stocks is falling below the assessment figures, and holders will not pay out 50 cents or $1 to save 25 or 50 cents, as the case may be. The flood has created a panic among large dealers. One of them told me recently, and he a shrewd observer, that it was only a question of a little time before the south end would have to close down.

The expenses have been cut down in every way, but still they are enormous. Besides, the lower levels that are now flooded will be entirely ruined for work in six months. There are some who say that beneath the flood there is a job. I don't think there is a job. To raise that water requires more money than can be raised at present. The Jacket pump alone eats up about $15,000 a month. A strike in the upper levels, of which there is hardly any hope, would create sufficient interest to make assessments possible. But this is only wild speculation. The north end very naturally sympathizes with the south end. But I have very little faith in the developments recently made in Union. There is no doubt a very fair ore body in that mine, but the ore is not rich enough to create enthusiasm, and it is extremely doubtful if what is shown up will more than pay for extraction. That is the reason the stock don't move upward. The neighboring mines appear to have fair prospects—that is all." At the gentleman's request we refrain from giving his name, but the foregoing is almost the exact language he used.

The Engineer.

Iron and Wooden Bridges.

The recent accident on the Boston and Maine railroad, where a passenger train broke through the iron bridge, has called out some comments in the press concerning the relative value of iron and wooden structures. The position is taken that there is yet considerable doubt in the minds of conservative railroad managers whether the change from the earlier types of wooden bridges, which have been worn out in service, to the later, and certainly more pleasing in appearance, iron bridges, has been attended with due economy, all things considered, or attended with greater or even equal safety. The question of economy does not admit of the same general treatment that other branches of the subject do, although the substitution of iron for wood by nearly all the leading railroads of this country speaks very well for the economy of the change.

In no other country has wood been employed in bridges so much as with us. The success of American engineers with wooden bridges has been the subject of admiration of the engineering profession the world over. Why they were led to develop this class of bridge, perhaps, arose from the necessity of building cheap bridges when railroads could not pay for any other. It is hardly fair to assume that engineers who have done so well with a material like wood cannot distinguish themselves to the same extent in the construction of iron and steel bridges. In fact, with the many fine examples of engineering skill in large span iron bridges, this cannot be considered an open question.

A margin of safety of five is one that is very often supposed to be employed. It is comparatively easy to provide just that margin in the full section of the different tension members. Some uncertainty may exist with the compression members, but greatest of all is the difficulty of getting the joints throughout to have their proportional strength.

The facility with which iron can be brought into various shapes is an advantage not possessed by wood. The shearing strength of timber is so slow, as compared with its tensile strength, that it becomes quite a problem how to make use of the greater part of its tensile value. So far as we have actual proof of the ability of the material to do its work, the advantage is on the side of the iron. It is claimed, in favor of wooden bridges, that they give premonitory signs of failure, that engine-drivers will discover these signs in running over the bridges early enough to have the necessary repairs made. But a locomotive and well-filled train of passenger cars is a startling kind of test to apply to a decrepit wooden bridge! If we are to rely upon such tests, let us hope the engine-drivers are men of more than ordinary judgment.

As to the durability of iron, it has been found, by German experiments, extending over a term of years, that iron is practically indestructible when strained within the limits bridge engineers require of their metal.

Tests of iron from old bridges that have been strained repeatedly as high as 20,000 pounds per square inch, have not shown the metal injured. The durability of wood has not been the object of such searching investigation. The difficulty of getting several large sticks uniform in quality upon which to make a series of experiments, interferes with the success of such an undertaking. Data that are available upon this subject, go to show that wood, under high strains, has very little durability. — *Boston Journal of Commerce.*

Use of Petroleum as Fuel in Russia.—Upon the Balachanskio railway the locomotives are heated with crude naphtha, which ie introdnced into the teuder as it comes from the wells, and there have been no accidents resulting from its use. All the shipe upon the Caspian sea are heated exclusively with the liquid combustible, the cost heing only half as great as that of coal. Experiments which have been made upon some of the railwaye show that a kilogram of naptha is equivalent to 8½ kilograms of wood, although the theoretic heating power is only three times as great. The use of petroleum with injectors for introducing it into the furnaces is very convenient—the combustion can be regulated with the greatest ease; the furnaces last much longer on acconnt of the absence of sulphur; there are no cinders, smoke or sparks, and the work of the stokers is greatly simplified.—*Soc. des Ingen. Civils.*

An Electric Pile-Driver.—At Hatfield Park, England, the piles to support a cofferdam across the River Lea have just been successfully driven hy the power irom a waterwheel situated at a distance, which power was transmitted by two dynamo-machines and a couple of wires to the gearing connected with a pile-driver of ordinary construction, erected on a large floating in the river. The machinery, although rather roughly constructed, worked well, lifting a dolly, weighing from four to five hundred-weight, with ease and regularity.

The Vulture mine, Arizona, has just contracted for 30,000 cords of wood, at $6 per cord. The Vulture company are now crushing 240 tons of ore daily, and will soon have in operation 20 additional stamps, making 100 in all, the largest mill in Arizona.

Useful Information.

Ancient Steel, Etc.

"A considerable steel-making industry exists at the present day in China, on the Upper Yangtze, whence the steel is sent to Tientsin for shipment and distribution. It fetches much higher prices than the Swedish steel imported into the country. The Chinese metallurgists recognize three kinds of steel, namely, that which is produced hy adding unwrought to wrought iron while the mass is subject to the action of fire, pure iron many times subject to fire, and native steel, which is produced in the southwest. The different names for steel are twang kang, or hall steel, from its rounded form, kwan kang, or sprinkled steel, wei tee, or false steel. The Chinese apparently have known how to manufacture steel from the very earliest ages."—*English Journal.*

Demachus, in the fourth century, B. C., records that different sorts of steel are produced among the Chalybes, in Sinope, Lydia and Laconis. That of Sinope was used for smiths' and carpenters' tools; that of Laconia for files, drills for iron, stamps and masons' tools, and the Lydian kind for files, swords, razors and knives. In Laconia, iron is said to have formed the only currency in the days of Lycurgus.

Pliny mentions that the best steel used in Rome was imported from China, a country in which copper or bronze swords are said to have been in use B. C. 219,748.

Iron and steel are proved to have been considerably in general use at Rome during the period of her wars in Western Europe.

The Book of Job is among the very earliest of literary works, its date being not definitely known, but in it iron and steel are separately named in one verse, and considerable familiarity with other metals is shown in the reading: "Surely there is a vein for the silver, and a place for gold where they fine it. Iron is taken out of the earth, and brass is molten out of the stone." The Book of Numbers also deals familiarly with the metals; in fact the entire Hebrew scriptures do.

An ancient historical writer makes particular mention of the process by which the Celtiberians prepared the iron for the purpose of manufacturing swords, so tempered, that neither shield, helmet nor bone could resist them, hy hurying iron under ground as Chinese, Japanese and Spaniards have also done in making swords that would cut small bits of iron without injury to the edge.

Corrosion of Lead by Lime.

There is, perhaps, no metal in which not only chemists, but the general public, is more interested in than lead. Every lead pipe that enters into the construction of a house or laboratory, soon acquires a history of its own, and though instructive, this history is not always agreeable. If it is a water-pipe, it is apt to be burst during a frost, and lead to the inundation of the building when the thaw begins; if a gas-pipe, it may, after a while, give rise to minute leakages, difficult to discover, and often highly dangerous. If a soil-pipe, it invariably becomes more or less corroded in the course of 10 or 15 years, and then the noxious effluvia of the drain are insiduously infused through the house; children fall ill without apparent cause, and even the strongest adults suffer frequently from this dangerous source of infection of the air. Again, if the lead is employed to line cisterns for storing water, and the latter be very pure, a certain amount dissolves in the water, and may give rise to colic, neuralgia, or even paralysis, in those who drink it. In this manner also lead enters into medicines prepared with distilled water which has been stored in lead cisterns (slate or asphalt cisterns are to be preferred).

In 1869 a paper was read at the British Association, at Exeter, by a well-known London chemist, in which some of these facts were brought very prominently forward. Quite recently, another source of danger has been pointed out in the daily papers; and some letters have appeared in the *Globe* upon the effects of lime on lead. It would appear from these that, contrary to what is generally believed, the presence of lime in water does not prevent lead from being dissolved, but rather promotes the corrosion of pipes and cisterns. We know that chloride of lime, so often thrown into closets, with a view of disinfecting them, has a most injurious action, giving rise to chloride of lead, which dissolves and corrodes the pipes in every direction, so that in the course of a short time sewer gas easily permeates through them. Other disinfectants of an acid mineral nature would probably act in the same manner. It is now known that when lime, mortar, or plaster of Paris is left in contact with lead pipes, they corrode more or less rapidly in these parts, and another source of mischief is thus pointed out.—*Monthly Magazine* (Eng.)

A Happy Idea.—Forty years ago a Frenchman, with the usual practical views of the nationality, conceived a happy idea for easily creating intricate designs upon plush. This happy idea was simply the application of a hot iron to the surface of the goods. The discovery was made in an accidental way, and cost him the good looks of a velvet dressing-gown, which his over-zealous wife had attempted to iron. His experience, however, suggested what was afterward, and is still called embossed plush.

Artificial Leather.—Numerous attempts have been made in years past to produce a material bearing a resemblance to, and useful for the same purposes as leather. Nothing practical ever grew out of these efforts, so far as we are aware, until Mr. Evans, an Eastern man, took the matter in hand. Like all investigators in untrodden fields, he worked to little advantage for many years, but each effort was a step nearer the object aimed at, and finally, after almost innumerable experiments and many discouragements, he succeeded in producing a substance which not only looks like leather but wears as well and for many purposes is superior to leather. The new material, which is called Evan's artificial leather, presents a handsome appearance, is durable, is not affected by heat or cold, and is impervious to water. We have seen shoes made from it that were well, and, to all appearances, were leather. Makers of cheap shoes should make note of this fact. This leather is prepared in all colors, and being largely used for the tops of boys' boots, for which purpose its water-proof qualities and cheapness make it especially fitted. It can also be used for covering furniture, and for the tops of carriages it forms a durable substitute for leather, as well as for upholstering carriage seats.—*Blacksmith and Wheelwright.*

Metallic Cloth.—A new material is about to be put upon the market, in the shape of a metallic cloth. An invention has recently been patented for the production of this cloth, which, if desired, can be impressed with a pattern, or printed upon. The mode of manufacturing the material is as follows: The metal intended to be used is rendered into small particles, short or long, according to requirements, and is then mixed with a sticky material, such as India-rubber; this mixture is transferred to a fabric made from cotton, wool, linen, silk or other textile material; the fabric is then dried and calendered or dressed in any suitable manner, so as to produce a smooth metallic face. After this preparation the cloth can be impressed with a desired pattern by the process of embossing; or the pattern may be printed on its surface in the usual manner. The cloth produced as above, when finished, is soft to the touch, and is very pliable. The liquid charged with the metal does not penetrate to the under side of the fabric, but leaves it quite clean.

A new friction match has a quantity of explosive compound sufficient to protrude slightly beyond the end of the splint placed in a cavity in the end of the splint. The end of the match is then dipped in paraffine or other suitable material.

Good Health.

Health in Town and Country.

An extended series of observations seem to have warranted two conclusions, both adverse to commonly received opinions:

1. There are more persons in lunatic asylums from the country than from the town.

2. The average of human life is greater in the largest cities, than in the country adjoining; yet farmers eat plain, fresh food, take abundant exercise, retire early, and get up by daylight, breathing the pure out-door air for at least half their existence. On the other hand, citizens retire late, rise late, eat food and fruits one, two, or a dozen days old; are in-doors three-fourths, if not nine-tenths of their time, breathing an air vitiated hy furnace heat and a variety of other causes, and take comparatively little exercise.

It is practically useful to note some of the general reasons which may very rationally be considered as explanatory of such results.

The universal tendency of concentration of thought upon one subject is to monomania, madness. This is so palpable a fact that argument is not necessary. When, therefore, the subjects of thought are few in number, the same tendency exists. The weather, the crops, the market, are the idol trinity of most farmers; in a wide sense, they think, talk, dream about nothing else with any special interest: all besides is secondary, and if, by any novelty, the mind is compelled out of its wonted track, it soon relapses into the old tread-mill circle, into the same rut of ages gone. In great cities this destructive concentration is almost an impossibility: the morning papers, the prices current, the stock markets, the accidents, the wars of nations, the exhibitions of curious and stirring things, keep the mind on the look-out; in fact, almost too active; there is scarcely enough time for needed rest. The day begins with running over the state of the world, as exhibited in the newspaper. From nine until four the whole mind is absorbed in matters of business; from that until near midnight, there is a comparative abandon to dinner, to social ties, to giving or receiving visits from acquaintances, friends and kindred, in going to the concert, the lecture, the opera, to evening parties, or other sources of agreeable diversions or profitable intercommunications.

The farmer, glorying in his health and strength, thinks his constitution impregnable; scouts at method and system and precaution, considering them as nothing but doctors' whims and old women's notions. He believes in eating hearty suppers and late; he has done it all his life, and is not dead yet, and resolves so to continue until the end of the chapter, when some morning the news goes round, "Died last night" of apoplexy, cholera morbus, cramp colic, or the like. At other times, bilious fever carries him from health to the grave in 10 days, in consequence of going to sleep in the entry or on the front stoop after a hard day's work; or he brings on some other malady hy damp feet, bad cookery, neglecting the calls of nature, or deliberately postponing them.

The citizen, on the contrary, has more or less informed himself on these matters, both hy reading and observation; he is compelled to pay deference to nature's laws; he knows that their infraction is attended with certain penalties, and his better judgment leads him to estimate properly the value of a wise course of life; while all the time he is relieved from the necessity of encountering great exposure to heat and cold, of excessive and exhausting physical efforts, which accidents and the hurry of the seasons impose on those who cultivate the soil.

Farmers will become healthier in body and in mind, in proportion as agricultural papers are taken, for several reasons: These publications uniformly contain a large amount of unexceptionable family reading, as to health, temperance, and sound morals; they will also gradually waken up the mind of farming people to experiments, to what is often sneeringly styled "scientific farming." Every day the helter-skelter mode of agriculture is becoming less and less remunerative; every day it is becoming more and more necessary to study the laws of vegetable growth, the habitudes and needs of plants and grains and trees; and in proportion as this is done, and the analysis of soils becomes an indispensable pre-requisite, there will be a world of novelty and light to break in upon the farming mind, to interest, electrify, and enrich.

The time will come when, to attempt the successful management of a farm, large or small, without some considerable practical knowledge of chemistry and botany and geology, will be considered the extreme of Quixotism. Meanwhile, let farmers and farmers' wives, with their children, bear in mind that to diminish the chances of a dyspeptic or bilious madness, or a premature death from acute disease, they should practice habits of personal cleanliness and bodily regularity; should eat only at regular hours and never between meals or after supdown, eat slowly and of plain food; avoid damp clothing and cold or wet feet, and cultivate a cheerful spirit, a courteous temper, and a loving, generous heart.

A Telegraph Story.—One of the operators in the Western Union office at Boston had an epileptic fit. His medical attendant spoke to him, chafed him and made every effort to arouse him, but in vain. Subseqnently one of his fellow-operators drew a chair up to the bed, and took the patient's hand in his. As he did so, he noticed a feeble pressure by the fingers, which pressure presently resolved itself into dots and dashes, faintly communicating to the tactile sense the words: "W-h-a-t d-o-c-t-o-r s-a-y a-b-o-u-t m-e?" Asked whether he could hear what was said to him, the patient signified assent by a slight motion with the tips of his fingers, and the result was that his fellow-operator got from the patient enough dots and dashes to describe his feelings to the physician, who was thus enabled to apply the necessary remedies. It is certain that no other method of communication was possible under the circumstances, since the sufferer from epilepsy, although he could hear, could neither speak nor move any of his muscles, except those situated in the digital extremities, and those only with the faintest requisite in electrical communication.

To Kill a Felon.—A correspondent of *Hall's Journal of Health* says: To kill a felon, or bring it to a head if too far advanced to kill, take poke root and boil till soft enough to make a poultice, apply, and if the felon is not too far advanced it will scatter it; if it is, it will hasten suppuration. It will deaden the pain in a short time and save much suffering. I have used this myself and know it to be good.

Expectancy of Life.—The chances of life have been carefully studied and tabulated by life-insurance men, and, barring accidents, seldom prove misleading. The life of an ordinary man or woman is about as follows: A person of 1 year of age may expect to live 39 years longer; of 10 years, 51; of 20 years, 41; of 30 years, 34; of 40 years, 25; of 50 years, 21; of 60 years, 14; of 70 years, 9; of 80 years, 4.

Out to The Eastward.—A considerable number of men have already raided out into the Walker Lake region and to other mining camps along or within easy reach of the Carson and Colorado railroad, and more will go in the same direction as soon as the weather becomes settled and reliable. Already a good deal of ore is being sent in from mines in that section, and much of it is very rich. Some of this comes from mines but recently located, and there are doubtless "as good fish in the sea as have been caught."—*Virginia Enterprise.*

New Process.—A dispatch from Elkland, Ind., says: Some time since, the Eureka Smelting Company was organized here for the purpose of testing a discovery made by S. P. Bresser, foreman of the copper department of the Lake-Shore shops, by which he claimed to be able to extract the precious metals from the most rebellious ore. They immediately built a small furnace here, sent for a car load of the ore, and although it was a kind that no one has ever been able to work before, he succeeded, and fully realized his expectations.

MECHANICAL PROGRESS.

Lack of Care in the Details of Iron Work.

A paper on practical iron work was recently read before the Civil and Mechanical Engineers' Society, England, in which it was remarked that sufficient care is not taken in the details of iron work. The points of attachment will generally be found to be the weakest parts; the compression members are considered as being able to bear four tons per square inch, while experiments and theory both seem to show that the strain which wrought-iron columns, of the form in which struts are generally made can sustain, more nearly approaches 2.7 tons per square inch of section, and that this value is in many cases too great. The loss from riveting in small girders is greater than is generally allowed for. The present form of upper and lower members in girders might be altered with advantage, vertical plates being used in the tension boom and gusset plates employed for attachment, allowing rivets in double shear. In bridges of small span ordinary lengths and sections of iron should be employed; but in large span bridges, when dead load predominates, greater refinement in design may be used with advantage. All iron work should be designed with regard to its erection, and in that which has to be sent long distances, there should be no overhanging pieces of any length.

Continuous girders, though economical in first cost, are objectionable for use in road bridges, owing to vibration, and it is doubtful whether their use is economical or safe in the end. Repeated shocks or vibrations producing fatigue will eventually cause the failure of all iron structures in which corrosion is not allowed to alter the conditions under which they were built, and as it may be concluded that the vibrations in continuous girders are more numerous, with an equal number of shocks of the same intensity than in those of the non-continuous type, the life of the former will be shorter than that of the latter. Alteration in foundations which often change the condition essential to the safe working of continuous girders are less liable to exert their influence on non-continuous girders. Close spacing of the cross girders of a bridge increases the number and extent of the vibrations and has an injurious effect on the girders themselves. The ignorant use of continuous girders may constantly be seen in the construction of warehouses and houses, where no care is taken to space the supports properly, where the quality of iron used is poor, where the margin of safety employed, as found from merchants' lists, is only from 2.7 to 3, and where failure of foundations is probable.

Engine Economy and Economical Engines.

A wide difference exists between the two conditions above named, although they are sometimes used in a sense which makes them seem to have the same value. An engine may be economical in its place, and for a certain duty, but if it is taken out and put to other work it will be found wasteful.

Engine economy depends wholly upon and has reference to, the kind and amount of work it is doing. A case in point occurs to us, which came under our observation a few months ago. A person had a large engine set up in a building where but little work was required of it. It was rated at 60-horse power, but the needs of the place were only about five. It was the practice of the engineer in charge to carry high pressure and cut off short, so that at the end of the stroke the card showed back pressure of about seven pounds, if our information is correct. The expansion curve went much below vacuum line and formed a loop, for the work on the engine was but little more than a mere friction diagram would show. This was no fault of the engine itself, as it was capable of very good performance under proper conditions, but it was an error in judgment of the builder in putting in such an engine for so slight a duty. The engine was economical enough, so far as its adjustments and designs were concerned, but there was no economy, but extravagance, in using a 60-horse engine to do 5-horse duty. This is a mistake not unfrequently committed by persons who buy machinery and fit up factories regardless of anything but mere guesses at how much power will be needed. Engineers of experience should be consulted on such matters if parties wish to avoid expense.

It is much better economy to put in an engine suited for the present work and enlarge it when the time arrives, than to put in a big engine and boiler that are not worked up to half their capacity, with the expectation that it will be needed in the future.—*The Mechanical Engineer.*

SCISSORS.—A new method of manufacturing scissors or shears consists in casting the handles of iron, and rendering them malleable; preparing the steel blades in the usual manner; welding the steel blades to the malleable iron handles by hammers or dies acting upon the parts that are welded together; and subjecting each handle and blade when cold, to a powerful pressure between dies that act upon the malleable portion to consolidate the metal, smooth the surface, and remove any imperfections in the shape.

A NOVEL INVENTION, which has for its object the automatic setting out of the packing rings of a piston-head within the cylinder, has been devised by the master mechanic of the Pennsylvania R. R. Co., and will be adopted by that company for use on their locomotives. The improvement consists of a solid piston-head suitably cored out for the reception of the packing rings and their actuating levers, as also for the two adjustable bolts which center the piston and provide the bearings against which the weight of the piston exerts itself to set the packing out automatically. The two operating levers are each fulcrumed in a block resting on the packing rings at the bottom of the piston, and extend, one on each side, into the upper circumference of the head, where they rest against other blocks having their bearings on the packing rings and constituting the *resistance* of the levers. The *power* is applied through the two threaded bolts referred to, and which work adjustably in screw bearings in the solid head. These bolts are each arranged on an angle of 30°. Thus, it will be seen that the whole weight of the piston rests upon these two bolts, which, in turn, bear respectively against their levers, whose fulcrums are in the bottom of the piston, and whose resistances or operating ends are in the upper part of the piston, whereby the weight of the same is utilized, through said levers, to bear directly against the upper circumference of the packing rings to expand the same in the upper part of the cylinder.

COPPERING IRON.—For the past ten years M. F. Weil has been testing specimens of cast and wrought iron and steel which have been coated with copper by his methods, without requiring any intermediate deposit or any finishing touches. The homogeneity of the deposits reproduces the most delicate details of ornamentation, so as to give the articles the artistic value of bronze. The cyanides, which are injurious to the health of workmen and which greatly increase the cost of coppering, are replaced in his methods by organic acids or by glycerine, materials which are cheap and which have the advantage of not being decomposed. The baths require no renewal of organic materials, provided they are properly supplied with oxide of copper. The well-known property of alkaline-organic solutions, of rapidly dissolving oxide of iron without attacking the metallic iron, facilitates the perfect cleansing of the pieces. When the oxide of copper requires renewal, the exact amount which is needed is determined by a very easy test. Various other metals, such as nickel, cobalt, antimony, tin, etc., can be deposited upon iron and other metals by his processes.—*Comptes Rendus.*

A NEW ROTARY WATER MOTOR.—A recent issue of *Dingler's Polytechnisches Journal* contains a description and several illustrations of Mr. J. Spohn's (Stettin) rotary water motor, which is apparently a very compact and durable piece of mechanism. The piston, if we may so call it, is provided with eight vanes, capable of turning about axes passing through their respective centers of gravity, while to the inside of the cylinder are cast four projections slightly touching the piston, and provided with channels through which the water-producing motion is introduced. The channels are in connection with the main feed pipes passing through the two separate cylinder covers. The vanes, when passing the projections mentioned, are depressed, closing at the same time the exit channels in the piston through which the waste water escapes. Having passed the projections, the pressure of the water causes the vanes to assume their original upright position. Accumulations of water in the machine are prevented by an orifice in the lowest part of the cylinder.

A NOVEL STREET CAR, which carries its track, is about to be put in practical use in Chicago. The Accommodation Car Company has begun operations in that city, with a capital stock of $1,000,000. The object of the company is to build and equip 1,000 cars and put them upon the streets of Chicago. The car is the patent of Mr. Prosser, and as regards present appearance, is a queer-looking craft, which carries its track along with it, and to all intents and purposes, is designed to traverse any and all lines of streets. The car, which is of the ordinary kind, is mounted in the middle upon a truck which sits on four wheels, each about 1 foot in diameter. These wheels run around the inside of two steel tires, each 10 feet in diameter, and which rests upon the ground, and are held only to the car by a set of wheel clamps. The car is designed to hold 50 people, and the owners claim that the more it carries the easier it runs. It will be stopped in the usual manner, and two horses will be required to pull it. The company say they intend putting the cars upon the principal streets of the city.

UTILIZING EXHAUST STEAM.—According to the Boston *Journal of Commerce*, an American invention has recently been patented in England, which consists in the method of, and apparatus for driving back into the boiler the exhaust steam from the engine. The apparatus is formed somewhat similar to an injector, and is connected with the exhaust pipe. Steam is pumped from the boiler and forced through a superheater and thence passes into the injector, its velocity driving the exhaust steam into the boiler.

SCIENTIFIC PROGRESS.

Sound.

Sound as a substance is nothing; that is, you cannot see it. Sound is produced or generated by causing some substance to vibrate in the air either by shock or similar action. Without air no sound can possibly be produced. Air is as necessary to sound as it is to combustion. If we drop a solid substance into water we find that the water yields at the point at which it was first subjected to a shock. This swelling we call a wave. When the first wave has made way for the substance creating the disturbance, it causes the water next to it to form another wave, not so great as the one first made, and so on until the power expends its strength when at last all action ceases. If the body of water is not sufficiently large to allow of this succession of swells to exhaust themselves it is reflected back to the original point. If the water be confined in a square vessel the waves in meeting the sides are broken, resulting in confusion. As it is with water so it is with air. No matter how rapid air may move, unless it comes in contact with some substance no sound is produced.

In a clear, dry air sound can be heard a greater distance than when the air is damp or otherwise defective in its sound-bearing capacity.

Sound is due very materially to the atmosphere in which it is generated, and where the effects are to be heard. It has been an old theory, that if we take a sea-shell and hold it to our ears, we will hear the swell of its native ocean. It is true that if we hold the shell as mentioned, we do get the sound like the rushing of air. The same effect may be had by holding an earthen inkstand to the ear. In this case we might naturally suppose the sound emitted to be that of the waves breaking over the clay that was used in making the ink vessel.

In musical instruments the cylindrical form is important. Where this form is not preserved various modifications of it are employed. The violin, for example, is composed of two outer walls. Separating these two pieces, and uniting them in a general whole, is what we call the side walls. Then comes the finger board. Again we have the button at the lower end; then we have the sounding-post placed in the inner side, and immediately under this is placed the bridge, over which the strings are drawn and held in proper position. The inner partition presents a line of swells and sweeps. The strings are adjusted to harmonize. To the how we apply a resinous substance to produce friction. We draw the how over the strings, which produces a vibratory sound. If the body of the instrument were made of thicker material, or without sweeps or curves, unpleasant sounds would be the result.

In the piano we produce musical sounds by hammering on wires when in proper tension. This hammering causes them to vibrate, to send off their sound to the sounding-board, which is then reflected to the outer air. Another example which it is well to refer to, is the snare drum. We stretch across each head a piece of sheepskin. Across the lower head the snares are placed. An air-hole is made in the body. When the upper head is struck, the air in the cylinder hammers against the lower head, causing it in turn to hammer against the snares, while the sound reaches the outer air by means of the hole in the body. When the drum is muffled a dull sound is the result. The xylophone is a good example of the sound-producing capacity of wood. A small hammer striking the pieces of wood, of which the instrument is composed, causes them to vibrate, sending off their wavelets of sound.

To produce sound we require, in connection with air, substances that have density, elasticity and vibratory power. If we suspend a common brick and strike it with any substance, say a piece of iron, a very dull sound is the result. The brick has a certain amount of solidity about it, but no elasticity or vibratory powers, and consequently yields no sound at the moment. If we take a stone of the hardest species we get better results than with a brick, because of its density. Steel has density, elasticity and vibratory powers, and produces sound. If we form the steel into a circle, leaving the ends in contact, we get an increased amount of sound. So long as steel vibrates so long will sound be emitted.

A bell has density, elasticity and vibratory powers, and is capable of containing air in a condensed form. If the bell is formed so as to consist of angles, as, for instance, the cow bell, we get the same confusion of sound as mentioned in describing the action of waves in water, that is, of water placed in a square vessel. If the bell be fractured there is no continuation of the sound, vibration becomes suspended because suspended by reason of the fracture. A barrel, perfectly tight, with the hung inserted, if struck gives a hollow sound much subdued. If the barrel were loosely constructed, the sound would be similar to that of the fractured bell. If we strike a square box, the sound is momentary. Its many angles cause a confusion of the sound waves. It is an old theory that a clear, frosty air allows of a greater amount of sound than a clear, warm air. This is incorrect. No matter where sound is generated, it will ever travel in search of the higher, purer and more expansive atmosphere.—*Blacksmith and Wheelwright.*

THE ARTIFICIAL PRODUCTION OF CRYSTALLIZED QUARTZ.—Considerable attention has lately been drawn to the artificial production of crystallized quartz, which was first obtained by Senarmont by heating gelatinous silica with hydrochloric acid. Daubree obtained it by the action of superheated water on glass, and Hautefeuille by treating silica at a high temperature with sodium tungstate. C. Freidel and E. Serasin have now prepared it by heating to a temperature below dull redness in a closed steel tube, lined with copper, a mixture of potash, alumina and gelatinous silica, the last in excess, in presence of water. In this way, after continuing the heat, in one experiment, for 14 and in another for 38 hours, they obtained silica wholly, or almost wholly, crystallized. The first experiment yielded numerous very regularly formed crystals of the ordinary quartz form (prism with the two rhombohedrons), which acted strongly on polarized light in the manner of native quartz. In the second experiment the crystals were larger (up to 0.5 mm. long, and 0.1 mm. broad), but mostly broken off at one end. They sometimes had the form of more acute rhombohedrons, with indications of tetartohedral forms, and many of them exhibited striations and modes of aggregation well known in native quartz.

THE EFFICIENCY OF FAURE'S ACCUMULATOR.—Prof. W. E. Ayrton, F. R. S., read a paper before a late meeting of the Physical Society of London, on "Faure's Accumulator," giving the results of experiments made by him and Prof. Perry on the efficiency, storing power and durability of the battery. The efficiency was got by measuring the power put in and comparing it with that taken out, by means of Perry and Ayrton's voltameter and ammeter. The authors found that the cell has great resuscitating power if left insulated after all the current appears to have been discharged. Care had to be taken to see that the cell was quite discharged by letting it stand on open circuit for intervals, and discharging between whiles. When this was done they found that the total loss for charges up to 1,000,000 ft.-pounds need not be greater than 18%. With slower chargee they got a loss of only 10%. As to the storage, a mean current of 10 Amperee gave after 18 hours' discharge (six hours on three consecutive days) 1,440,000 ft.-pounds of work, equivalent to one horse power in 43 minutes. This cell contained 81 lbs. of red lead, thus making a capacity of about 18,000 ft.-pounds per pound of red lead. The cell showed no deterioration after two months of work.

POISONOUS EFFECTS OF METALS.—Some curious results relating to the comparative poisonous effects of different metals have been noted by M. C. Richet. He finds that copper is 600 times more toxic than strontium, notwithstanding that its atomic weight is less. Lithium, the atomic weight of which is but a twentieth of the weight of barium, is yet three times more poisonous. Even in the case of the same chemical family of metals, no relation exists between atomic weight and toxicity. Thus, cadmium (atomic weight 112) is just half as poisonous as zinc, the atomic weight of which is 65. Lithium, with an atomic weight of 17, is 70 times more poisonous than sodium. It may, therefore, be concluded that there is no relation between the chemical function of a body and its toxic power. Potassium and sodium, the properties of which are so similar, differ widely in their poisonous effects, one gram of the former being nearly 250 times more poisonous than one gram of the latter. The limit of toxicity assumed by M. Richet is the maximum quantity of the poison dissolved in a liter of water in which a fish can live 24 hours.

THE IMPROVEMENTS IN THE MICROSCOPE have been gradual. Singularly each step in improvement has led to changes in the theory of microscopic physiology, and yet it has, in some cases, been found afterward that the same facts could be observed almost or quite as well with the older form and arrangement of lenses. Quite recently the introduction of a system of lenses with short focal distances, one-sixteenth of an inch and less, has led to the discovery that human saliva is filled with flat, nearly transparent, irregular corpuscles.

THE EYE OF THE HOUSE FLY.—Prof. Fairfield thinks there are reasons to believe that the common house fly, with its numerous lenses, capable, as has lately been proved, of change of focus, like the human eye, by a circular muscle, overlooked by early entomologists, can avoid the serious difficulties we meet with in high powers, and could distinctly recognize objects only a twenty-millionth of an inch in diameter.

DR. LAMBERT says it is a common error that the joints of animals have always a synovial fluid which is in the nature of a lubricant. The elephant, with his relatively moderate motions and great weight, has admirable cartilages but absolutely no lubrication therefor.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Mar. 30		Week Ending Apr. 6.		Week Ending Apr. 13		Week Ending Apr. 20	
Alpha	80c	55c	50c	35c	75c	45c	1.15	50c
Alta	3.10	2.15	3.05	2	3.40	2.60	3.40	2.55
Andes	75c	65c	55c	50c	85c	55c	80c	75c
Albion	2.80	2.20	2 90	2.30	2.95	2	2½	2.10
Argenta	30c	....	10c	....	10c	5c	5c	....
Addenda	15c	10c	15c	....	15c	....	....	....
Belcher	55c	45c	50c	45c	45c	40c	50c	40c
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	6½	5½	5½	4.30	6½	4 65	6¾	6¼
Bullion	50c	25c	30c	20c	30c	20c	55c	25c
Bechtel	30c	....	30c	....	25c	....	25c	....
Belle Isle	....	....	....	....	....	....	....	....
Bodie	6	4.65	5¾	4¾	5½	5¼	6	5¼
Benton	45c	25c	40c	20c	30c	25c	30c	25c
Bulwer	2¼	....	....	....	2¼	....	2.20	2.10
Boston	50c	....	40c	30c	25c	....	....	....
Black Hawk	15c	10c	10c	....	10c	....	10c	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	10c	....	....	....
Caledonia	5c	....	....	....	....	....	....	....
California	30c	15c	15c	10c	20c	10c	15c	10c
Challenge	....	....	15c	....	....	....	....	....
Chollar	1.20	1.05	1.10	65c	1.15	85c	1¼	1
Confidence	75c	60c	85c	....	75c	65.	80c	....
Con Imperial	5c	....	40c	30c	25c	....	....	....
Con Virginia	80c	61c	60c	50c	75c	55c	85c	70c
Crown Point	45c	40c	45c	40c	50c	40c	70c	55c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	15c	....	....	....
Concordia	1.65	1.60	2.60	2¼	2.25	....	1.30	1
Comordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	35c	30c	30c	....	25c	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	1.95	1.40	1.65	1.90	1.90	1.70	1.85	1.65
E. Mt. Diablo	20c	15c	20c	15c	15c	....	30c	15c
Eureka Con	23¼	21¼	23¼	20	22¼	21¼	22¼	21¼
Exchequer	35c	25c	25c	15c	30c	20c	35c	25c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	50c	30c	45c	35c	40c	35c	40c	35c
Gould & Curry	1.20	1	1.35	1.25	3.45	21	1.35	3.15
Hale & Norcross	1.05	90c	90c	60c	1.40	75c	1.10	1.05
Head Center	....	....	....	25c	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	10c	....	15c	10c	15c	....	30c	15c
Justice	60c	50c	55c	40c	1.05	45c	75c	60c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	30c	25c	25c	20c	....	....	....	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	10c	....
Lewithan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Bello	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1¼	....	1¼	....	....	....	1¼	....
Martin White	8	7½	7¾	....	4	3½	4.30	4¼
McClintoc	....	....	....	....	....	....	....	....
Mono	2.40	1.85	2	1.65	1¾	1.4?	1.80	1.40
Mexican	7¾	6¾	6¼	4.65	9	5	8¾	8
Mt. Diablo	5¼	4½	5	4¼	4¾	4.55	4½	....
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	1.70	1.40	1.45	1	1.20	1	1.15	1.10
New York	5c	....	....	....	....	....	....	....
Northern Belle	8¾	8½	8	7¾	8¼	8¼	8	7¾
North Noonday	1¼	1.45	1.35	85c	....	....	1	95c
Navajo	1	45c	80c	45c	95c	90c	1.10	1
Occidental	80c	....	80c	70c	....	80c	1	....
Ophir	3.05	2.80	2.60	1.90	6	3.05	4.65	4.20
Original Keystone	....	....	....	....	....	....	....	....
Overman	30c	25c	25c	15c	30c	20c	30c	25c
Oro	65c	45c	60c	40c	50c	30c	35c	30c
Paris	1	50c	....	....	....	....	....	....
Potosi	1	90c	90c	85c	1	75c	90c	85c
Queen Bee	5c	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	95c	80c	90c	55c	2	1.20	2.40	1.90
Seg Belcher	1½	....	1¼	1¼	1½	....	1¼	....
Sierra Nevada	6¾	6¼	6¾	6¼	9¼	5¾	8	7¼
Silver Hill	15c	....	15c	10c	20c	10c	20c	15c
Silver King	17¼	17¼	17	16	17	16¾	17¾	16¾
Succor	....	....	....	....	....	....	....	....
Summit	20c	10c	20c	10c	....	....	20c	....
Scorpion	75c	65c	65c	45c	75c	70c	1	90c
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Staodard	....	....	....	....	....	....	....	....
Syndicate	40c	20c	35c	30c	30c	....	30c	....
Tioga Con	40c	25c	30c	25c	20c	....	25c	20c
Tiptop	4¼	4	4	3¾	3.60	2.80	4¼	4
Tuscarora	....	....	....	....	....	....	....	....
Union Con	10¾	9¾	9¾	8	17¼	7¾	13¾	11¾
Utah	4	3.70	3.70	2.60	6¾	3.15	5¾	5
Ward	3¼	3	3¼	....	3¼	....	3¼	....
Wales	60c	60c	60c	....	60c	55c	55c	....
Yellow Jacket	1.10	95c	1	90c	1.15	95c	1.10	1.05

Sales at S. F. Stock Exchange.

Thursday A.M., Apr. 13

2320	Alta	2.55@2.70	
50	Andes	.75c	
150	Alpha	1.15	
240	Belcher	.50@55c	
150	Benton	.60c	
20	B & Belcher	.6¾	
120	Chollar	1	
35	California	.10c	
200	Exchequer	.30c	
440	Gould & Curry	3.20@3.15	
550	Hale & Nor	1.8 @1.85	
100	Mexican	.8¼@8½	
200	Overman	.25c	
360	Ophir	4.30@4.45	
460	Sierra Nevada	.7¾@71	
90	Silver Hill	.15c	
50	Scorpion	.90c	
280	Savage	2.15	
20	Utah	.5	
810	Union	.12¾@13	

AFTERNOON SESSION.

1050	Albion	2.10@2.15
100	Argenta	.5c
350	Bodie	.51@55
50	Bulwer	.2
40	Bodie Tunnel	.1.40
50	Boston	.30c
150	Concordia	.1.80@1¾
170	C Pacific	.3 c
200	Day	.1.60
95	Eureka Con	.22c
100	E Mt Diablo	.10c
300	Goodshaw	.35@30c
400	Holmes	.5c
150	Mooo	.1.30@1.40
55	M White	.4¼@4¾
1100	Navajo	.1.10
100	Northern Belle	.7¾
2 0	Noonday	.1.05@1
380	N Noonday	.1
300	Oro	.35c
120	Southern Nev	.6¾@6¾
50	Silver King	.17

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Northern Belle, April 14th, $7,534; Standard Con. (for March), $13,112; Standard, April 11th, $16 809; Contention, 11th, $13,958; Northern Belle, 13th, $6 025; Bodie, 17th, $7,434; Mt. Diablo, 11th, $6 810; Tiptop, 16th, $10,101; Savage, 15th. $4 500; Christy, 17th, $4.282; Star, 14th, $2,278; Silver King, 9th, $10 387; Tombstone district (for March). $467 908; Girard (Tombstone), April 15th, $4,291; Tombstone M. Co., 15th, $5 050; Stormont, 11th, $3 475; Germania, 11th, $6,400; Hanauer, 11th, $2 280; Horn Silver, 11th, $17.500; Frisco, 11th, $9 967; Stewart, 11th, $6,000; Mammoth, 12th, $2.360; Horn Silver, 12th, $20,000; Frisco, 12th, $5,150; Barbee & Walker, 12th, $1,282; Horn Silver, 14th, $7 500; Frisco, 14th, $8 964; Hanauer, 14th, $4 770; Stormont, 14th, $3.600; Germania, 14th, $4,300; Horn Silver, 15th, $12,500; Frisco, 15th, $4,862; Horn Silver, 16th, $17,500; Bullionville, 16th, $2,000; Contention Con., 17th, $15,000; Bodie Tunnel, 17th, $2,400.

A THOUSAND persons are daily leaving Chicago for Dakota, Manitoba and Montana.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Albion Con M Co	Nevada	10	30	Mar 6	Apr 10	May 2	D B Chisholm	327 Pine st
Alpha Con M Co	Nevada	16	50	Mar 20	Apr 26	May 19	Wm Willis	309 Montgomery st
Argenta M & M Co	Nevada	10	10	Apr 12	May 19	June 12	E M Hall	327 Pine st
Belcher M & M Co	Nevada	30	25	Apr 14	May 17	June 5	J Crockett	327 Pine st
Belmont M Co	Nevada	21	15	Mar 11	Apr 17	May 15	J W Pew	310 Pine st
Belvidere M Co	California	13	25	Feb 9	Apr 12	May 1	C V D Hubbard	310 Pine st
Benton Con M Co	Nevada	7	25	Mar 10	Apr 14	May 4	Wm H Watson	302 Montgomery st
Best & Belcher M Co	Nevada	23	50	Apr 5	May 11	June 2	Wm Willis	309 Montgomery st
Bullion M & M Co	Nevada	23	30	Mar 29	May 2	May 24	J M Brazell	328 Montgomery st
California M Co	Nevada	3	20	Mar 29	May 6	June 5	G P Gordon	309 Montgomery st
Goodshaw M Co	California	10	10	Mar 21	Apr 22	May 11	C G Harvey	3 9 Montgomery s
Hale & Norcross S M Co	Nevada	73	50	M r 14	Apr 19	May 10	J F Lightner	309 Montgomery st
Independence M Co	Nevada	9	15	Feb 24	Mar 31	Apr 24	E M Hall	327 Pine st
Iowa M Co	Nevada	16	03	Mar 8	Apr 15	May 6	C C Leavitt	411½ California st
Leeds M Co	Utah	6	30	Feb 23	Apr 3	May 1	D B C Isholm	327 Pine st
Mayflower Grav M Co	California	15	10	Mar 7	Apr 11	May 3	J Merizio	328 Montgomery st
Mexican G M Co	Nevada	18	1 00	Mar 13	Apr 15	May 9	G L McCoy	309 Montgomery st
Modoc Con M Co	Califor ia	10	30	Feb 14	Mar 28	Apr 25	J W Pew	310 Pine st
Navajo M Co	Nevada	10	20	Mar 7	Apr 27	May 22	J W Pew	310 Pine st
New Coso M Co	California	13	10	Mar 30	May 1	May 22	D B Chisholm	327 P ne st
Niagara G & S M Co	Nevada	6	20	Apr 1	May 3	May 25	O C Miller	402 Montgomery st
North Gould & Curry G & S M Co	Nevada	2	50	Mar 18	Apr 19	May 11	C H Mason	331 Montgomery st
Ophir S M Co	Nevada	41	1 00	Mar 7	Apr 8	May 2	C L McCoy	309 Montgomery st
Plnal Con M Co	Arizona	3	30	Apr 3	May 8	May 23	W W Traylor	309 Montgomery st
Potosi M & M Co	Nevada	8	50	Apr 12	May 16	June 6	W F Leau	309 Montgomery st
Savage M Co	Nevada	50	50	Mar 7	Apr 10	May 1	E B Holmes	3.9 Montgomery st
Scorpion S M Co	Nevada	11	10	Mar 9	Apr 13	May 4	G R Spinney	310 Pine st
Sierra Nevada M & M Co	Nevada	72	1 00	Mar 21	Apr 26	May 15	E L Parker	309 Montgomery st
Silver Hill Con M Co	Nevada	1	05	Mar 29	May 6	May 27	L J O'Farrell	Montgomery Block
Silver Belt M Co	Arizona	1	15	Mar 8	Apr 17	May 15	J W Pew	310 Pine st
Star M & M Co	Nevada	10	10	Mar 22	Apr 22	May 15	Wm S cart	320 Sansome st
Tellurium G & S M Co	California	26	10	Anr 1	May 8	May 24	H P Bush	431 California st
Union Con S M Co	Nevada	19	1 00	Mar 21	Apr 25	May 15	J M Buttington	309 Montgomery st
Utah S M Co	Nevada	38	1 00	Mar 11	Apr 14	May 3	G C Platt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Arizona-Utah M Co	Arizona	2	01	Mar 7	Apr 21	May 12	N O Carnall	320 Sansome st
Bay State S M Co	Nevada	1	02	Dec 29	Mar 31	Apr 24	J W Pew	310 Pine st
Caledonia M & M Co	Nevada	12	25	Apr 5	May 18	June 15	W Letts Olliver	328 Montgomery st
Compromise M Co	Nevada	1	20	Feb 14	Apr 18	May 5	D Buck	309 Montgomery st
Equator M Co	——	—	20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Golden Fleece Grav M Co	California	25	30 00	Apr 15	May 20	June 8	F Schirmier	7s5 Fo som st
Hohnss M Co	——	4	10	Apr 4	May 8	May 29	E A Holmes	318 Pine st
Luna Con M Co	——	1	05	May 31	May 31	May 5	R D Hopkins	436 Montgomery st
Metallic M Co	——	—	20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Metallic-Equator M Co	——	—	20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Monumental Tunnel M Co	California	2	05	Mar 31	May 3	May 22	D B Chisholm	327 Pine st
Mt Auburn M Co	California	7	10	Mar 11	Apr 11	May 11	J T Newell	320 P ne st
Peabody M Co	Nevada	4	05	Feb 25	Apr 10	Apr 29	R D Hopkins	436 Montgomery st
San Pedro G & S M Co	California	4	03	Feb 27	Apr 3	Apr 27	W G Holmes rm 1	Sherman's build'g
Santa Annita M & M Co	California	3	03	Apr 17	May 22	June 12	J M Buttington	3 9 California st
South Bodie M Co	California	6	15	Mar 27	May 2	May 25	Henry Dess	309 Montgomery st
Tower Con M Co	Nevada	1	10	Apr 7	May 12	June 1	G W Sessions	309 Montgomery st
Wide Awake P & M Co	Arizona	16	10	Mar 17	Apr 25	May 25	C Hilderbrandte	cor Bush & Kearny
Western Home M Co	——	3	05	Apr 10	May 11	June 15	A Halsey	323 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Buckeye M & M Co	Nevada	W B Lowden	213 Sansome st	Annual	May 1
Justice M & M Co	Nevada	R E Kelly	419 California st	Annual	May 1
Maryland Con M Co	——	E F Farnsworth	219 Sansome st	Annual	May 4
Morgan M Co	Nevada	C L Tilden	533 Kearny st	Annual	May 6
Mt Potosi M Co	Nevada	J H Sayre	330 Pine st	Special	Apr 24
Woodville Cou S M Co	Nevada	R E Kelly	419 California st	Annual	May 1

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Apr 12
Contention M Co	——	D C Bates	309 Montgomery st	25	Feb 23
Eureka Con M Co	Nevada	W W Traylor	309 Montgom ry st	50	Apr 27
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Apr 11
Silver King M Co	Arizona	J Nash	315 California st	25	Apr 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Apr 12

The Mining Share Market.

There is very little to report new in the mining share market. The Comstook mines, the main prop of the share market, are not showing up anything.

Messrs. Patton, Taylor and Forman, the committee to whom was referred the work of perfecting a plan for the drainage of the flooded mines, had a meeting, and did some preliminary business. They arrived at the conclusion that the water is not so strong as has been supposed. It is quite probable that the Belcher pumps will be utilized. They will be set up either at the Bullion or at the Yellow Jacket shaft. There is room for them at the Jacket, and the plan of placing them there is now being figured upon. With the Belcher pump, there is no doubt that the water can be pumped out at once.

The *Enterprise* says: The Union Con. mine is looking well throughout. On the 2500 level the ore breasts are showing very rich ore to the south and east of the winze. It is also improving on the west, to the northward of the winze. On the 2600 level the outlook is good for finding a large body of ore. A drift is now being run northeast from the bottom of winzs No. 1, known as the wet winze, which has already passed through a streak of fine ore eight ft. in width. This lies west of where it is expected to find the main ore body, and was not looked for. This drift is to the southward some 140 ft. from the ore body that is being worked on the 2200 level, and is in the same ore channel, but it is now seen that it is not in the same ore body. It is a new streak that has come in on the west. According to the survey, they have yet some distance to go to cut the ore body of the 2500 level, and other streaks are liable to be cut before reaching it. The sump of the joint Union and Sierra Nevada east winze is completed, and the work of cutting out a station at the 2900 level will be commenced to-day. As soon as this station is completed, drifts will be started to prospect the ore bodies that have been found above. The progress of these drifts will be watched with great interest by mining men.

THE stampede to Wood River is becoming great, and the stage company are putting their line in order to meet the great rush. A gentleman down from Blackfoot, says the stampeders are going in on foot, in many instances, while others have their own conveyances, pack animals, etc.

THE Mammoth Mining company's furnace at Tintio is now turning out two tons of matte per day to the stack. Twenty stacks are to be put up, and there is ore enough to keep them running.

Roasting Telluride of Gold.

The roasting of the telluride of gold or of telluride of silver rich in gold (Petzite), is a most delicate operation. All the telluride combinations with gold do not show a loss of the gold to a notable extent while roasting, but some do, and that to a considerable amount, up to 20% and perhaps even more. The loss is no mechanical one occasioned by the draft of the furnace, but principally by volatilization. This occurs sometimes at a very low heat. As soon as the ore gets hot enough to show rising fumes, it is advisable to take a sample and assay it, and not to increase the temperature until the result of the assay is known.

Mr. Kustel, in his "Roasting of Gold and Silver Ores," gives an example as to the irregular condition the gold is in, in some combinations with tellurium, and cites Petzite containing 24.80% of gold and 40.60% of silver. Heating a small piece of this mineral on a piece of charcoal or on the blade of a knife to the temperature of about 323° 6', the melting point of lead, the bluish-gray mineral turns suddenly yellow, without changing its shape. Under the microscope this yellow color is found to be due to innumerable perfect gold globules which cover the surface. The gold separates from the silver and tellurium in a molten condition, while the two other metals remain unchanged. The gold requires 1200° 6' to become liquid, and in this case it melts even below 323°.

Concerning the wasting of these tellurides, Mr. Kustel says: If salt is present during the roasting, the chloride of tellurium volatilizes voluminously, and it is possible that under this condition the tellurium causes the gold to volatilize likewise. The author, by his own experience—having 4% of salt in the ore on account of silver—found the loss of gold amounting to 8% before the ore was properly red hot. This was two hours after charging. Under this circumstance the continuation of roasting was impossible; the ore, therefore, was drawn out and then chloridized with chlorine gas, and a good result obtained; not, however, without lixiviating for a while with chlorine water after the largest part of the gold was first extracted after chlorination with gas. Whether the above loss would have occurred in such proportion if no salt had been added, cannot be stated. It is indispensable, then, to have condensing chambers connected with the roasting-furnaces, if tellurides have to be treated, in order to condense the volatilized metals.

THE bullion receipts for the past week in Salt Lake were $180,000, including the Ontario.

MINING SUMMARY.

This following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

RICH STRIKE IN THE "LAST RESORT."—Monitor *Argus*, April 10: We understand from reliable sources that J. P. Ray, of Monitor, has struck some of the richest silver ore yet found in Alpine county. Mr. Ray had some samples assayed during the past week which assay $7,422 in silver and $836.25 gold, total $8,261.25. This character of ore he encountered in running his tunnel in his mine known as the Last Resort. Mr. Ray has also found a vein 3 ft in width assaying $38.58 silver, and $12.12 gold, and is now running a drift up on this vein which is running into Monitor mountain. The ledge is becoming wider as progress is made, and the ore improves in value. Mr. Ray is deserving of much credit for his perseverance in developing this property, having spent almost 4 or 5 years' work and a large amount of money in developing this claim. The present outlook for successful mining in Alpine county is deserving of the attention of capitalists. That we have rich ore and large deposits cannot be denied. We are happy to congratulate Mr. Ray on his strike and fully believe there is a grand future for Alpine in her bullion moduct nud other precious metals. The Alpine Gravel & Hydraulic Mining Co. are pushing the work on their ditch as rapidly as the weather will permit. Should the weather clear up and remain pleasant they will soon have the ditch completed to their claim.

COPPER SHIPMENT.—Isabello C. & S. M. Co. are shipping below over 4 tons of copper, saved from the workings of the Stella ore, at the Exchequer mill.

AMADOR.

MAHONEY.—Amador *Dispatch*, April 15: Yesterday was pay day at the Mahoney mine, and it caused a ripple of joy to shoot through the anatomy of the average citizen. The outlook for this mine is at present more encouraging than it has been for some time past, and a prosperous future can now be reasonably expected. Prospecting at the Con. Amador mine still continues, but with what degree of success we are unable to say.

BUTTE.

THE GARDEN RANCH.—Oroville *Mercury*, April 14: Some very rich quartz has been taken out of a ledge on Garden Ranch, the property of Mr. Chas. St. Sure of this place. The ledge is about 3 ft wide, and can be traced for a distance of half a mile. Mr. St. Sure says the rock will assay $50 to the ton, and he is making preparations to thoroughly prospect the ledge. Garden Ranch is bonded to Eastern parties for $20,000. Mr. St. Sure reserving one-half of all quartz ledges found on it.

CALAVERAS.

GLENCOE MINES.—Calaveras *Chronicle*, April 15: Excellent developments are being made in the Fidelity mine. Work is pushed with all the energy possible. A new pump is to be put in as soon as it can be delivered at the mine. Operations continue uninterruptedly in the Norwich mine with good prospects. The company's mill was started and run for a short time, but the impassibility of the roads for the teams cut off the supply of rock, and it had to be shut down until the condition of the roads would permit hauling to be resumed. The Valentine mill has commenced running again we are informed. A large amount of rock was about to be milled when the cold snap came on and cut off the supply of water, necessitating the suspension of operations until the weather had moderated sufficiently to permit the flow of water to run the mill. The season is too far advanced to apprehend any more delays from the same cause, however, and we hope to be able to chronicle good returns from this mine.

RAIN.—This section of country has been treated to copious showers at intervals of a few days for some time past. Although the great fall of rain and snow during the winter temporarily interfered with and retarded some of the mining operations, as a whole the season will prove very favorable to the mining interest, also in furnishing an abundance of water which will permit work to continue through the greater portion of the summer.

WEST POINT.—The prospect of the mines in this vicinity appears to be good. They have plenty of rich rock on their dumps, and it is likely to stay there if we don't get some good weather so that the teams can haul it to the mills. Ayers & Co. are running their hydraulic in full blast up at the "new diggings," where a number of new discoveries have been made. Mr. Wm. Crockett struck a well defined quartz lode at Hunter's flat, showing plenty of free gold. The vein is about 2 ft wide, and in places lead and iron sulphurets predominate over the quartz rock. Work will be resumed when the snow melts. The Lockwood mine has quite a patch of good rock on its dump, likewise the Canada mine. Mr. T. Porteous ground 7 tons of rock from the Florida mine which yielded $50 per ton. T. Sawyer & Co. are running a tunnel on the Nellie Mead mine, which is good property, having produced in by-gone days a goodly amount of bullion. The lead averages from 1 ft to 2½ ft in width, and has been worked for a distance of 300 ft above the water level; the tunnel taps the lode 25 ft deeper than the old workings, therefore we expect good results from that mine. Messrs. Rose & Jenkins have finished their new mill and intend commencing to crush rock as soon as the weather permits. The new air shaft on the Lone Star mine is nearing completion. Work is being pushed forward on the Champion mine by the owners; likewise the Riverside mine. Messrs. Smith & Gibson have had to close down the Pride of Somerville on account of the severity of the weather, but intend to resume operations again as soon as fine weather returns. They have about 25 tons of rich quartz on the dump. Domingo Rubio & Co. have struck a splendid lode near town which prospects big. Carey & Co. have struck good rock in their mine at Skull flat, but are delayed from further work on account of the unsettled state of the weather.

EL DORADO.

NEW FLUMES.—Georgetown *Gazette*, April 14: The Cal W. & M. Co. are constructing new flumes at Fraser flat, which will require 60,000 feet of lumber. The main flume will be 5 ft in width and 2 ft in depth. They are being enlarged to meet the increased demand for water. The work of enlarging the reservoir at Georgetown is about done for this season. The enlargement is from 6 ft to 12 ft in depth and nearly doubles its capacity. Work of development on several promising quartz mines is actively going ahead. Better times, boys, close at hand.

INYO.

DARWIN.—*Independent*, April 15: Mr. J. S. Gorman, accompanied by Mrs. G., paid Independence a visit yesterday. From him we learned the following items concerning mining operations in southern Inyo. In the last run of 48 days the Defiance furnace put out 188 tons of high grade bullion, mostly from Defiance and Custer ore. About 200 tons of screenings were run through from the old wash dump, or slag-pile. It is the intention to smelt over all of the dump as soon as sufficient lead ore can be obtained to work with it. The work of developing the Defiance mine is going on from the 300 level, from which an incline is to be sunk to a depth of 500 ft. In the north drift, 300 level, a new body of ore, which assays 101 ounces per ton in silver and 60% lead, has been struck. It is intended to start the furnace again about the last of next month. Work on the Phœnix mine—the old Promontory, now owned by Messrs. Reddy, Gorman, Eddy and Mee—has been pushed ahead. The main incline has been sunk 60 ft, making a total depth of 240 ft, at which point the ledge has been crosscut and north and south drifts started. In the former horn-silver ore was struck the day before Mr. Gorman left. During the last run a lot of ore from the Winnetts mines, in Slate range, was smelted which assayed 277 ounces per ton silver. At this place they have an enormous amount of 60-ounce ore, but the

cost of transporting it to Darwin—$25 per ton—precludes its being worked there. Somebody hunting a location for a quartz mill should look this thing up.

MONO.

BODIE.—*Free Press*, April 18: Good progress was made at all important points in the district last week. The Noonday and North Noonday joint incline was sunk 28 ft, making its depth 186 ft below the 512 level. It is the intention to continue the incline down to the water, which will probably be found 50 ft or more below the bottom of the winze. Hon. W. M. Stewart was in town Sunday, remaining just long enough to look at the development, as far as made. To the inquiry as to what he thought of it, he said: "I have never seen the Noondays looking so well. They assure the permanency of the district. The development is below the water line, and is very important." The Lent shaft was sunk 10 ft during the week, and is now down 847 ft. The winze on the rich vein in Bodie (No. 17) is now 33 ft deep, and the drift 132 ft in length. The average of the pulp run through the mill during the week reached the high figure of $115. In the stopes of Bodie tunnel considerable improvement has taken place in the quality of the ore. The east crosscut of the Red Cloud, at the 700 level is in 46 ft.

NEVADA.

MINING BOOM AT MOONEY FLAT.—*Transcript* April 13: Great excitement is occasioned at Mooney Flat, in the lower part of this county, over the discovery and location of some placer mining ground. A company from San Francisco, composed of Geo. Barstow, Peter Malley, Jas. B. Lee, M. W. Fox, Edward G. Stetson, Geo. H. Forster, Octave G. du Py and Alton H. Clough located about 160 acres. Another, the Bonanza M. Co., consisting of J. B. Fuller, W. A. Wilmer, John Clowth, B. Butler and Thos. Corrigan, located about 120 acres further north, and still another on top of the above 2 locations, who claim that the first 2 are null and void, as Mooney Flat mining district has never taken any action to conform to the Government mining laws. The district laws say that 20 ft frost, running to the center of the hill is the lawful location. The first 2 companies, thinking the laws had been changed, made their locations in conformity to the U. S laws. The last locators got away with the pie, which is a good one, well baked and well seasoned, a la gold-dust. There is much excitement over the locations by the old '49ers thereabouts, who now say, "dog gone it, why didn't I locate it 30 years ago. I always thought the channel went through that way." The liberal offers of the Excelsior Water Co. to prospectors will induce others to make locations, when we may expect to hear of good old times again in that part of the county.

SMARTSVILLE LOOMING UP.—A correspondent writing to the *Transcript*, from Smartsville, says: "For the last 3 months our village has resembled the habitation of the dead, and fears were entertained that it would always remain so. About that time the management of our mines changed hands, and unfortunately for the village and surroundings it did not fall into the hands that added any great energy to the working of the mines. Nine-tenths of our citizens had nearly given up the hope that we would ever recover our former activity and liveliness. But James is himself again, and all join in huzzas in the prospect that he will again bring our once prosperous village to its former self."

THE WIDE WEST.—The Wide West quartz mining company, at Canada Hill, are having about 40 tons of quartz crushed at Crosby's mill. It is expected it will go to about $20 per ton. A large number of very rich specimens were found and not included in the 40 tons. Before any more rock is taken out the hoisting works will be removed to a more eligible place, owing to the dip of the ledge.

THE O'CONNOR MINE.—Grass Valley *Union*, April 12: The gentlemen who have purchased the O'Connor mining property, which is situated east of the Idaho mine, have commenced active operations. Several companies of tributers, numbering in all 20 men, have commenced work on the line of the croppings, and will soon have a large quantity of quartz raised ready for crushing at the company's mill. To-day Mr. O. Crandall, of Oakland, who was the original contractor for building the mill and hoisting works, will arrive, and at once proceed to put the machinery in complete working order. This will require several weeks, when the mill will be started up to crush tribute and custom rock. This will be a great convenience to prospectors in that part of the district, and save a large part of the expense that they have hitherto had to pay for hauling quartz to more distant mills. After the hoisting and pumping works are put in order, the shaft, which is 1565 ft deep will be pumped out, the necessary repairs to the timbering made, and the work of extending the levels commenced. There is a drain tunnel 600 ft long on the ledge, which drains it to the depth of 100 ft, which will permit of tribute work being done from the surface down to the tunnel level, while more ground is being opened at a lower depth. The ledge in the mine is a large one—being from 3 to 7 ft in width, and can be extracted so cheaply that even if it be of low grade, with the excellent facilities at hand can be worked to a profit. Former crushings of quartz from the mine gave fair results, although no regular pay chute was found, but the present company expect to open up one in the explorations they have in view. Developments will be pushed energetically during the coming summer season.

PLUMAS.

SOUTHERN EUREKA MINE.—Greenville *Bulletin*, April 12: When the great storm had been raging some days, work in the drifts had to be stopped because the timbers were all snowed under, and for some time ore was taken from the stopes only. At present timbers can be had again, and now work is resumed in the drifts. The ledge still maintains a uniform width of about 13 ft. It is worthy of remark, that in each successive tunnel opened at greater depths, the ore becomes richer.

TAYLOR-PLUMAS MINE.—This mine is developing in a way to cause some surprise to the knowing ones. When the very rich ore was recently struck there it was a general remark that it was only a bunch, and as such bunches always robbed the ledge, as soon as this was passed the vein would be poor; instead of this, however, it continues to show a large vein of very superior ore. The upraise is now 40 ft above the level of the tunnel, and as it is advanced the width of the lode is fully maintained, and the quality of the ore averages better. The character of the walls in which this ledge lies is worth notice. The hanging wall is solid gray granite, from which the ledge matter parts, leaving a surface as smooth as if it were polished; the foot wall is a softer brown rock, from which the ore parts as easily as from the other. This is the lowest ledge yet opened in Green mountain, being at its base and nearly on a level with the valley; all the other mines are at a considerable elevation. If the mountain were divided lengthwise, this mine would be about the center

PLACER.

PINO MINING ITEMS.—Placer *Herald*, April 15: On the Klees brothers' mine, near Pino, a new shaft is being sunk, and the gravel is showing very encouraging prospects. This has been demonstrated to be a rich lead, but want of means has prevented the owners from properly developing it. Recently some Oakland parties have taken hold of the property, who intend to put it in good working shape. The Laird hydraulic mine, also near Pino, is in full blast; work a large force and 2 giants. The hydraulic elevator is used in this mine successfully. George Lee is running a tunnel to tap the same lead on which the Klees mine is located. He is now in about 300 ft, and expects to strike gravel and pay in 50 ft further.

SIERRA.

A GOOD PROSPECT.—*Sierra Co. Tribune*, April 13: A very nice prospect was found at the Ruby mine last week. About a quarter of an ounce of coarse gold was panned out from a small quantity of gravel taken from the winze that had been sunk to a depth of 25 ft from the drift above their main tunnel. The appearance of a prospect at this point is very encouraging, and great hopes are entertained of reaching the main channel in a short time. After this object is accomplished, the main tunnel will then be pushed ahead and connection made with the drift above, which has been run ahead of the tunnel, to the present time about 500 ft.

HYDRAULICING.—A force of men has been put at work in the American Hill hydraulic claim, and with a large head of water they are doing good execution in washing. The mine paid well last season, but the owners anticipate still better returns this summer, as the channel is widening out, and the gravel is apparently of better quality.

TUOLUMNE.

WATER.—*Independent*, April 15: After many freezings and delays in mining ditches, water now runs down hill in peace and plenty, and the miners are busy in gathering the gold harvest. Prospects are good for a long and prosperous season, as the Sierras are piled with snow—reservoirs which the summer's sun will gradually empty for the benefit of the toiling miner.

NEVADA.

WASHOE DISTRICT.

UNION SHAFT.—*Enterprise*, April 16: Are putting in a pump bob at the 2000-level, and repairing the 1000-drift to the Union-Mexican winze.

UTAH.—Timbering and repairing the incline near the 1350 level. The main south lateral drift on the 2500-level has been extended 28 ft.

CONSOLIDATED VIRGINIA.—On the 2500-level south drift No. 2 has been advanced 33 ft. On the 2700-level joint Cal fornia east drift No. 2 has been advanced 32 ft.

MEXICAN.—On the 2 00-level the main north lateral drift has been extended 20 ft, and the main south drift 25 ft. On the 2900-level the north drift has been advanced 27 ft.

OPHIR.—On the 2700-level the main south lateral drift has been timbered up and cutting the drain completed. On the 2900-level the main south lateral drift has been advanced 26 ft.

CALIFORNIA.—On the 2700-level the joint Con. Virginia east drift has been extended 32 ft. On the 2700-level the main south lateral drift has been extended 42 ft.

SIERRA NEVADA.—On the 2500 level the winze in east crosscut No. 2 has been sunk and timbered 8 ft.; north drift No. 2 has been extended 24 ft, and the main north drift 32 ft. On the 2700-level main north drift No. 1 has been extended 27 ft. The joint Union Con. east winze has been sunk 8 ft.

UNION CONSOLIDATED.—On the 2500-level the winze has been sunk 10 ft below the floor of the stopes, passing through good milling ore. During the week 511 tons of ore have been extracted from the 2300 and 2600-levels, and 682 tons have been sent to the mills. Bullion in office, $10,004.37.

BRADSHAW DISTRICT.

AT WORK.—*Silver State*, April 13: Some two years ago several ledges were discovered about 25 miles west of north from Winnemucca. A new district was organized and named Bradshaw, and though the ore assayed well in silver, the district, for some cause, was abandoned, barely sufficient work having been done to hold the claims. Last fall Messrs. Nase, Wilder, Pollock and Fagit went to the district and spent the winter there, developing their mines. They have 12 or 14 claims. One is prospected by a shaft to a depth of 60 ft, and shows a vein 6 ft wide, with rich ore; another is prospected to a depth of 25 ft, and a third to a depth of 20 ft, both showing ledges about 2 ft wide, and carrying rich ore. They purpose sending a lot of the ore to the Winnemucca reduction works shortly.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, April 15: The main drift from the 5th shaft level has been extended 24 ft during the week, the total distance from the station being 34 ft. The main winze from the 4th level continues in the same formation as last reported. About 60 ft above the 2d level a small chimney of very good ore has been opened into. There are no changes of note in the other shaft levels. The adit and the levels above present about the same appearance as last week, and are showing no diminution of ore production either in quantity or quality. The daily output of ore has been about 85 tons. Both mills are running steadily, and are doing the usual amount of work. Shipments of bullion for the week ending April 10 h amounted to $13,559 88; and the total shipments on April account unto the same date aggregate $20,118.50.

MOUNT DIABLO.—Everything in the mine is showing much the same as at the time of last report. The stopes near winze No. 1, from the west drift on the 3d level, are opening well, and showing a good body of first-class ore in several places. The stopes below the 2d level, near the center of the mine, continue to yield good ore, as also do the stopes west of the shaft on the 1st level. Shipments of bullion were made on the 8th inst., amounting to $8,001.82, and on the 11th inst. of a valuation of $8,810.61.

EAST MOUNT DIABLO.—The north crosscut is now in 40 ft, and the ground is very favorable. The south crosscut is in 12 ft, and every foot advanced shows a decided improvement.

GENERAL JACKSON.—The work at this mine is progressing as usual. The stope is still yielding ore, and some drifts are being run from it, and good results are expected.

ESMERALDA DISTRICT.

WIDE WEST TAILINGS.—*Esmeralda Herald*, April 15: In excavating for a cellar under the Court Exchange saloon building last Monday, Ed. Twohey and John Woodford struck a large deposit of Wide West tailings. In the days when the Wide West was running there was some very rich ore crushed, and a considerable of it. Willow gulch, from the mill to the court house, was covered with tailings from 2 to 6 ft deep. But the action of the water since then has carried away and covered them up until now there is no sign of them left on the surface. The discovery made last Monday caused many to visit the cellar, and some set to work with pans to see if they could get a "color." It is thought by some that by sluicing the main channel of the creek from the old Wide West mill site to the Del Monto station, a distance of about 3 miles, it could be made to pay handsomely, and we doubt not this will be done some time.

LEWIS DISTRICT.

THE MINES.—*Lewis Herald*, April 12: Owing to the shutting down of the Starr-Grove mine and the mine under the same management, but little has been done during the week in the mines up the canyon. On our last visit the Star-Grove mine had good ore in the south 300-level, increasing in thickness as the drift was advanced. The crosscut in the north 300-level showed stringers of rich ore, and the indications were favorable for striking a body of ore near the hanging wall. The ledge in the Bothwell winze was about the same as last week, no change having taken place. The indications in the chloride are very favorable; also in the Eagle tunnel.

BETTY O'NEAL.—The stopes in the Betty O'Neal are "away up." About 7 tons of first-class ore is being extracted daily. The drifts on the ledge on the lower south level look well, and are turning out some good ore. The superintendent, Mr. D. P. Pierce, expects to begin hauling the ore to one of the mills during the present week for reduction, and from the present appearance of the ore-piles at the mine the management have underrated its value. Native and wire, also ruby silver, can be seen in many pieces, and the pile of ore now on the Betty O'Neal dumps is by far the richest lot of ore that we have seen in the camp.

MORNING STAR.—The contractors are still sinking the Morgan incline on the Morning Star mine. The ledge looks well. We also hear that work will be resumed shortly on other parts of the mine.

MAMMOTH DISTRICT.

MARBLE FALLS.—Cor. Grantsville *Bonanza*, April 12: Marble Falls is situated in Mammoth district, 4½ miles west of Elsworth, 5½ miles east of Lodi and 10 miles north of Downieville, which makes it a central point. Thirteen years ago last month an incorporated company, known as the Marble Falls M. & M. Co., commenced operations at this point. The object of this organization was to mine for gold, not paying attention to the silver contained in the quartz. The great expense at the time of getting supplies in, and the old story of mismanagement made their stay short. The ore is free milling, and that, too, of the finest character, most of the ledges being large and well-defined. The average in gold is from $16 to $20 per ton, silver from $40 to $60 per ton, although there are several places that show a much better average; but I understand that all experienced mining men now claim that free milling ore that will pay $30 per ton is good enough, provided there is any amount of it. The wood and water is convenient and plenty. With all these advantages (and I ass re you that they are not overrated) people who wish o prospect can not find a better field, at any rate we cordially invite all interested in mining to come and see for themselves. Messrs. Frank McPherson and Wm. Anderson are faithfully working on the McPherson mine. They are sinking an incline following the ledge. In sinking they average a ton of ore per day that will mill at least $250 and probably $300 per ton. This prospect is pronounced by experts one of the finest and most valuable in the State to-day. The mine is open to all who may wish to come and examine it for themselves. Henry Dube and Albert Labeau have another prospect a short distance south of the McPherson that shows well. They are at this time engaged in driving a tunnel to cut the ledge; the ore body is about 20 ft in width and assays a way up in the hundreds. There are but few men working in this vicinity at present, but as the snow is off the hills and the weather splendid we expect a rush soon.

ARIZONA.

STRIKE IN THE AUNT SALLY.—Tombstone *Epitaph*, April 11: There is a block of mineral ground bounded by the East Side on the west, the Mizzen Top on the south, the Alps and Horseshoe on the east, and the San Rafael and Hard Up on the north, that, in our judgment, has no superior in the district, for the same area. This plot of ground is covered by the Independence and Aunt Sally locations. The whole surface shows evidence of strong mineralization underneath, and the limited development being done is proving that the surface indications do not belie the contents of the lower strata of rock. Near the south end of the Independence a vein of ore was found cropping out near the east side line of that claim and the west line of the Aunt Sally. This vein has a strike northeast and southwest; therefore it enters the Aunt Sally location on its strike and not on its dip. The owners of this location started in about four weeks ago, and have sunk a shaft down to a depth of 20 ft, following the ore from the surface. Last night, when work was suspended, the vein of rich ore was nearly 2 ft wide, with about 1 ft more of second class, somewhat mixed with porphyry and quartzite from the wall rocks. The ore is carbonate and chloride, contained in granular quartz of the finest possible texture, and characteristics which indicate great strength in the vein. If this vein continues to develop as finely, as they go down upon it, as it has in the past, it will prove the Aunt Sally and Independence equal in value to any mines in the district.

YAVAPAI COUNTY MINES.—Prescott *Courier*, April 15: It is patent to all old-timers here that the industry of mining is steadily coming forward as the greatest industry of Yavapai county. Regular shipments of silver from Humbug district, south of the Prietta mountains, tell the story of successful mining in that district. The move recently made in the direction of prospecting the largest ledge in the county, the Mammoth, of Silver Mountain district, makes assertion doubly sure that the great ledges of this long neglected district are at last attracting the attention of capitalists. E. S. Junior and other miners are proving to the world that there are in Bradshaw district as good gold and silver mines as exist anywhere. The Peck, Black Warrior, Prince and other mines in Peck district, all rich, fair-sized veins, tell the tale we wish told from one end of the country to the other. Messrs. Mee & Goblin have settled for a fact the existence of paying mines in Turkey creek district. The Dos Oris and other mining companies are sounding the praises of Hassayampa district, by bringing to the surface ton after ton of ore which will mill from $100 to thousands of dollars per ton. Groom creek district, it need scarcely be said, is about the richest gold district in the county. Walker, with its many ledges of rich and moderately rich rock, is good enough for men who have stood by her through evil and good reports and seasons of depression. Developments in the Belle, Flata Bonits, Middleton and other mines of Big Bug district give good proof of the existence of great wealth in the pine-clad hills of the district, while her lowland mine-owners point with satisfaction to the Silver Belt and other veins. Castle Creek, Black Hills, Walnut Grove, lower Agua Fria and Black Canyon districts possess great mines of gold, silver and copper. As incentives to working the mines, we have to offer abundance of timber for all necessary purposes, water, and a climate which for health cannot be improved on.

COLORADO.

LEADVILLE NOTES.—Rocky Mountain *Mining Review*, April 13: Manager Ford, of the Wolf Tone, shipped a lot of ore to the La Plata smelting works last Monday, running very high in lead. The shipment consisted of very desirable carbonate ore. The gross receipts from sales of Little Pittsburg ore last month will amount to about $18,000, netting the mine about $7,000. The new No. 2 shaft in the northern portion of the property, near the Amie line, was started up last Saturday. The Green Mountain lode, at the head of California gulch, is working two shifts of men, and accumulating considerable rich ore on its dump. Shipments will begin now in a very short time. The shaft and levels of the Little Silver mine, adjoining the Lee on the east, are undergoing repairs preparatory to the resumption of active exploration work. The mine will be worked by Mr. Kearny and others. The Leopard group of mines at the head of California gulch, is being worked, and producing some ore. At the Matchless mine, more attention is being paid at present to prospecting work than to stoping and extracting ore.

THE FLETCHER STRIKE.—Georgetown *Courier*, April 13: The Matilda Fletcher mine, on Democrat, is again in big pay. It is being worked by Warren Young, under lease, and in driving a level from a raise a distance of 25 ft, about $7,000 worth of ore has been extracted. The ore vein is in places 2 ft thick, and will average a foot in thickness, and as the vein is large in both the roof and bottom, and also the breast of the drift, but little idea can be formed as to the extent of the ore body. On the 7th of this month 71 tons of ore were milled, which was taken out during the preceding month, by an average force of 5 men employed at running the level. The lot netted $2 880.65, the returns being 854 ounces per ton for first class and 254 ounces for second class. The mine is owned by the Fletcher M. Co., of New York.

RED ELEPHANT.—A few days ago your correspondent took a stroll among the mines of Red Elephant that are in pay—the Free America Extension East, Bowldor Nest, Free America and White—all of which are producing large amounts of ore, and increasing each month. There is one thing encouraging about the mines of this mountain—they invariably increase in both quality and quantity of ore as depth is gained. Ore were milled, which was taken out during the preceding month, by an average force of 5 men employed at running the level. The lot netted $2 880.65, the returns being 854 ounces per ton for first class and 254 ounces for second class. The mine is owned by the Fletcher M. Co., of New York.

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IDAHO.

NEW STRIKE IN THE ONTARIO.—Ketchum *Keystone* April 15: We have just received information to the effect that a new and valuable strike had been made April 4th, in the main shaft of the Ontario, one of the Rooks group of mines, situated up Warm Spring creek. Over 1,000 tons of high-grade ore can be seen already, and an extra force of men will be employed immediately to bring out the precious metal. This strike is, without a doubt, one of the richest made on Wood river, and fully substantiates the assertion, that in the vicinity of Ketchum the richest mines are to be found.

NEW STRIKES.—The Black Hawk, one of the Philadelphia, Co.'s properties, on Warm Spring creek, has a shaft in over 240 ft, and are getting out some very fine ore. Last week a 3 ft vein was struck on the 70-level, and several men added to the force. The Philadelphia M. & S. Co. have struck 138-ounce ore in the 70 ft shaft of the Deer Trail mine, up Warm Spring Creek. The North Fork, No. 1, has ore that assayed as high as $5,000 to the ton.

A $40,000 SALE.—Information was received here last Sunday that a group of three mines, on Warm Spring creek, known as the Erwine, Nos. 1 and 2, and the Tenbrook, owned by Ed. Moffit and Robert Erwine, had been purchased by Col. Greene for the Philadelphia M. & S. Co., of this place. The price paid over by Wells, Fargo & Co., of Salt Lake City, was $40,000. The mines were discovered by the owners in 1880, and shipped considerable rich ore to Salt Lake last season.

MONTANA.

BIG STRIKE IN ONLY CHANCE.—*Inter-Mountain*, April 12: It is learned this morning, from Hon. M. Saunders, superintendent of the Only Chance mine, at Highland, that within the past few days an important development has taken place in that once very productive property. The new shaft has been sunk to a depth of 500 ft on the east or foot-wall side of the vein. The air being bad in the bottom, it became necessary to make connection with the old workings at a depth of 450 ft. A crosscut west was accordingly started, which, at a distance of 14 ft, tapped a ledge of free gold-bearing ore of high grade. This new vein has been penetrated 7 ft without striking the hanging wall. The new strike is believed to be separate and distinct from the ledge as opened up in the old workings, and is evidently a continuation of a 6-ft vein which was penetrated by the new shaft at a depth of 185 ft from the surface. The 450 ft crosscut will be extended without delay to a connection with the old shaft, after which, the needed ventilation being secured, a second crosscut from the bottom of the new shaft will be run to tap the old ledge at a point below all former development. Then the extraction of ore will begin at a lively rate. It is intended to start up the mill on the 1st of May, with the certainty of an abundant and continuous ore supply.

OREGON.

PROSPECTING.—Jacksonville *Times*, April 14: Gus Leland correspondent says that E. F. Walker is prospecting about 4 miles above the Grave creek house, and is running a tunnel in a high bench, several hundred feet above the creek. Over 70 ft of this tunnel has already been dug. Most of the miners are still piping or ground-sluicing. The melting snow keeps up the water.

NOTES.—Miners of Jackass creek are favored with plenty of water yet, and make good use of it. Some of the miners have already begun cleaning up, as water has commenced to fail in many localities. Ingram & Dean still have a good head of water, but expect to commence cleaning up soon, after a fair run. The Squaw Lake Ditch Co.'s diggings are being operated on full time. Lannes Klippel is acting as foreman. George R. Justus, who was in town this week, informs us that the miners of Foot's creek have plenty of water, and expect to make a good run this season. Parties from below have located copper mines near Waldo and Illinois river, Josephine county, and we are assured that they will be thoroughly prospected soon. Thomas Carr, of Foot's creek, was in town Saturday, and exhibited two nuggets of gold, worth about $35 each, as also several smaller ones. They were taken out of a claim he is interested in. Charley Gilmore, a little son of D. M. Gilmore, picked up a nugget worth $80 in William Clarke's mine, situated near the head of No 7, a tributary of Althouse creek, Jos phine county. Several other pieces, worth from $6 to $19 each, were picked up the same day. This is one of the best pieces of property in that section.

NEW MEXICO.

ALL IN LUCK.—*New Mexican Mining News*, April 12: The mining districts in the vicinity of Santa Fe are all in luck just now. The starting up of the works of the San Pedro and Canyon del Agua company, on the 15th of April, will make things lively in the New Placers; the operation of the smelter at Cerrillos, which was put in motion a week ago, will make the lower end of the Cerrillos district boom, while the concentrator at Bonanza City, now in course of construction, and the smelter at the same place, the machinery for which arrived yesterday, may be expected to enliven the upper end of the district within a very short time. In two months more both districts will be on the high road to fortune.

VARIOUS MINES IN LOS CERRILLOS DISTRICT.—The present great influx of miners and investors at Los Cerrillos mining district, and the certainty that another smelter and reduction works will be speedily erected in the Vallecitos, indicate the near approach of a boom, and a big one. The erection of sufficient machinery to meet the requirements of the whole camp, which is all that has been needed to put the whole district in motion, is assured, and the camp is bustling in activity to-day. The Bottom Dollar, Little Freddie, Great Western, Ruelenia, and that class of mines, having enormous quantities of ore on the dump and in sight, will doubtless first reap the advantages of adequate machinery. The L. H. Whitson Co. is steadily developing the Ruelenia, and the Santa Fe Bonanza M. & T. Co. is preparing to prosecute work in driving its New England tunnel to meet the Ruelenia, when the latter shall have reached the depth at which the former will intersect it. Messrs. Rathbone and Johnston, the new President and Secretary of the Santa Fe Bonanza M & T. Co., are Eastern gentlemen, who have recently become identified with and interested in this company, and in whose hands the management now rests. The arrival of the machinery for the reduction works at Bonanza has given the enterprise which they have in hand a greater impetus, and the near future will find the mines of the company in a state of development not yet attained by any property in the district. The machinery alluded to above will be located near the Bottom Dollar mine, which is one of the most promising properties in the district, and from which there are now from 300 to 400 tons of ore on the dump. This ore will be reduced just as soon as the smelter is available, which will probably be within 30 days.

UTAH.

HORN SILVER.—Southern Utah *Times*, April 15: The Horn Silver Co., is shipping from 12 to 15 carloads of ore per day to their Francklyn smelters. The whole 5 stacks are running to their fullest capacity.

CACTUS.—The shaft is down about 18 ft on the Cactus mine in Copper gulch. Quite a good showing of copper pyrites was struck during the week, which continues to get better as the shaft goes down. This claim occupies the intervening ground between the New Haven and the Comet.

LULU.—The Lulu is still being pushed ahead vigorously, with the most gratifying results. Numerous reports of the most flattering character have been freely circulated about this mine during the week, for which there must be some good foundation; but we are unable to say at present just how far they are true.

SOUTH HORN.—Mr. M. L. Cody is still pushing work night and day on the South Horn, with an earnestness that shows he has gone to work with the intention of showing up a second Horn Silver. Mr. Cody was superintendent of the Horn Silver mine while it was under the management of the old company, and we predict that ere long he will be superintendent of another big mine on the same giant ledge.

A SHAFT is being sunk on the New Haven, a copper mine, just below the Cactus, in old Copper gulch. They have a body of ore about 4 ft wide, in which ruby copper shows thick. This is only on top of the ground, and as the croppings on this claim are immense, the prospect for finding a large body of high-grade copper ore below is good. This property is owned by M. L. Cody and the Mahoney brothers, and it is their intention to push the work of development as fast as possible.

California for Immigrants.

A Description of the State by the Immigration Association of California.

[The following description of California and the inducements offered to immigrants is prepared by the Immigration Association, and is published for that Society].

THE IMMIGRATION ASSOCIATION.

This Association is supported by and is under the control of the business men of San Francisco.

It is organized for the purpose of furnishing *free* information concerning California, and to assist immigrants in finding employment and permanent homes in the State.

All possible care will be taken to have the information given by the Association clear and *reliable*.

The Association is endorsed by the Governor of the State and by the Board of Trade of San Francisco, as follows:

INDORSEMENTS.

[From Governor Perkins].

SACRAMENTO, Dec. 17, 1881.

Arthur R. Briggs, Esq., President Immigration Association of California—DEAR SIR:—I notice with pleasure the formation of an Immigration Association in San Francisco; and it is gratifying to me, both as a citizen and as Governor of our honored State, that it should have fallen into such worthy hands. I congratulate the members thereof in their selection of its officers, and beg to add my endorsement thereto. Their names will give it strength and confidence in the community, stamp it with character, honesty and integrity, and result in advancing the best interests of the State. Very respectfully,

GEO. C. PERKINS, Governor.

[BY THE BOARD OF TRADE.]

At a meeting of the Board of Trade of San Francisco, held at the rooms of the Board, Dec. 9, 1881, the President, Jacob S. Taber, in the chair, the following resolutions were read and adopted:

Whereas, The question of Immigration is one of vast importance to the business men of this city, and we believe the time has come when it should receive intelligent consideration at their hands; and

Whereas, This Board of Trade has, through its action, directed public attention to the subject, and been instrumental in bringing about an organization calculated to do much good to the State; therefore be it

Resolved, That the IMMIGRATION ASSOCIATION OF CALIFORNIA, organized under the laws of this State, has the fullest approval of the Board of Trade of San Francisco; that the known character of the gentlemen composing the Association entitles them to the confidence and support of the business men and capitalists of the State.

Resolved, That, in the opinion of this Board, any information distributed by the IMMIGRATION ASSOCIATION OF CALIFORNIA will be wholly free from personal motives; and from its reliability and character will be worthy the confidence of all persons seeking knowledge of the State.

OFFICERS OF THE ASSOCIATION.

The Directory of the Association is as follows:

OFFICERS:

Arthur R. Briggs,.....President
W. Steinhart,.....Treasurer
W. L. Merry,.....Vice-President
A. W. Preston,.....Secretary
C. H. Street,.....Land Officer

BOARD OF DIRECTORS.

James R. Kelly, W. Steinhart,
Wm. L. Merry, T. L. Barker,
James Duffy, J. V. Webster,
Wm. Blanding, Arthur R. Briggs,
W. N. Hawley.

EXECUTIVE COMMITTEE.

James R. Kelly, T. L. Barker,
J. V. Webster, Wm. Blanding,
Arthur R. Briggs.

MEMBERS OF THE ASSOCIATION:

Jas. R. Kelly, J. A. Folger,
W. W. Dodge, W. N. Hawley,
Wm. L. Merry, W. Steinhart,
Jules Cerf, Henry Casanova,
Henry Payot, Geo. K. Porter,
M. Ehrman, Jas. Duffy,
T. L. Barker, Wm. Blanding,
Arthur R. Briggs, C. W. Whitney,
J. V. Webster, John C. Hall,
C. F. Bassett, A. A. Wheeler.

GEOGRAPHY OF CALIFORNIA.

It has been truly said that "California has a peculiar topography. No other State comprises within so small a space such various, so many, and such strongly marked natural divisions, isolated volcanic peaks, vast domes of granite, steep and rugged mountain ridges, fertile and beautiful valleys, bare deserts, spacious bays, magnificent rivers, unparalleled waterfalls, picturesque lakes, extensive marshes, broad prairies and dense forests—all these are hers." The State extends in a northwesterly and southeasterly course about 750 miles, with an average breadth north of Monterey of 200 miles, and south of that point of 300 miles, and comprises within its limits an area of about 155,000 square miles or 99,000,000 acres, and is the second largest in the Union.

POPULATION.

It has a population of only 850,000, much scattered, yet the total annual productions of the mines, farms and manufactories amounts to over $150,000,000. The people have nearly $150,000,000 in the savings and other banks, and are generally enterprising and prosperous.

TOPOGRAPHY.

There are two great mountain ranges running northwest and southeast, namely: the Sierra Nevada and the Coast Range. The former is from 5,000 to 8,000 feet high, and the latter from 2,000 to 6,000 feet. The two ranges are connected in the southern part of the State at Tehachapi and again at Mount San Bernardino. The Sierra Nevada extends along the eastern border of the State, and the Coast Range along the coast to the north and south boundaries of the State. The Sierra Nevada is about 450 miles long and connects with the Coast Range again by a latitudinal range running across the northern portion of the State. The base of the Sierra Nevada Range north of Fresno has an average width of about 80 miles. The Coast Range averages about 65 miles in width.

Between the two ranges are the great Sacramento and San Joaquin valleys, which are about 450 miles long, by 55 miles wide, and may be termed the heart of the State.

In the northern part of the State and north of the junction of the two great mountain ranges is the Klamath basin, through which runs the Klamath river in a southwesterly course, between steep hills and mountains and rocky cañons, for a distance of about 225 miles to the ocean.

The whole basin of the Klamath is very rugged for a distance of forty miles from the coast, and along the main river there is very little valley or bottom land. Near the lakes are large bodies of land. The largest tributaries to the Klamath, the Trinity and Salmon rivers, run through a country almost as rugged as that bordering on the lower mainstream. Scott and Shasta rivers—smaller tributaries—have fertile valleys of bottom land about five miles wide and forty long. Pine, cedar and fir forests cover the mountains, and there are other valuable trees both on the mountains and in the valleys.

In the extreme southeastern portion of the State is the Colorado Desert, which is about 140 miles long by 70 miles wide.

Another great basin, called the Mojave Basin, extends into the middle eastern border of the State, the surface of which is cut up by many irregular ridges of barren rocky mountains.

There are many rivers. In the central portions are the Sacramento and San Joaquin, each about 350 miles long in their meanderings, which are the only navigable streams in the State. There flows from the Sierra Range westward into the Sacramento, the Pitt, Feather, Yuba, American, Cosumnes and Mokelumne rivers. Into the San Joaquin, the Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla and Fresno. Into Tulare lake, the Kings, Tule and White rivers, and into Kern lake, the Kern river. All of these are considerable streams, with an average length of about 120 miles. The upper half of each is in the steep and rugged mountains, where they are torrents. After reaching the plain their currents are gentle and the banks low, fringed with oak, sycamore, cottonwood and willow.

But few streams flow eastward from the Coast Range, and these are not all permanent. The rivers of this range flowing westward into the ocean, are necessarily short. Those south of San Francisco are the San Lorenzo, Pajaro, Salinas, Cuyama, Santa Inez, Santa Maria, San Buenaventura, Santa Clara, Los Angeles, San Gabriel, Santa Ana, Santa Margarita, San Luis Rey and San Diego, many of which are constant streams to within ten or fifteen miles of their mouths, and all of them passing through rich valleys. North of San Francisco the main streams of the Coast Range which empty into the ocean are the Russian, Eel, Elk, Mad, Klamath and Smith rivers, besides many others of less importance, all of which are permanent streams, bordered with narrow valleys at the foot of the mountains.

To all the rivers of the State there are many tributaries along which are good agricultural lands.

The Coast Range is composed of a multitude of ridges, and is intersected by numerous long, fertile and narrow valleys, such as the Los Angeles, Salinas, Santa Clara, Sonoma, Napa and Russian River. These are among the most fertile valleys in the State.

The Sonoma and Napa valleys are particularly noted for the production of grapes and wines.

There are many important lakes—the Tulare, Owens, Kern, Clear, Klamath, Goose, Fall, Honey, Elizabeth, Tahoe, Mono and Dry lakes. There are also many smaller ones.

Along the coast of 900 miles there are numerous good harbors, the most important of which are those of San Francisco, Wilmington and San Diego. The former is one of the finest land-locked harbors in the world, and the latter is not excelled by many.

THE FOOTHILLS.

The western base of the Sierra Nevada mountains, for a width of about twenty miles, and bordering the Sacramento and San Joaquin valleys is known as the foothill region, and is included in the estimate heretofore given as the width of the Sierra range. The "foothills" extend from the northern to the southern extremity of these valleys. The temperature, up to a hight of about 1,500 feet, is similar to places in the same latitude in the valley. In the latitude of Sacramento there is a slight increase of rainfall graduated by the increase in elevation. South of Sacramento the increase diminishes.

Throughout the whole of this region living springs are numerous. Every agricultural product that can be grown in the valleys may be produced with equal facility in these foothills. Ordinarily the land has to be cleared of trees. Fruit trees and vines thrive better than in the valleys. Wood is everywhere to be found.

There are more than 3,000,000 acres of these lands open to settlement under the homestead and pre-emption laws.

CLIMATE.

One of the chief advantages of California is its admirable climate. It is much varied, differing greatly in different localities. In many counties thirty miles travel takes one from the region of oranges to where only the hardy fruits thrive.

In the valleys the winters are mild. In summer the nights are cool, and cloudy days are few. Violent wind storms, thunder, lightning, hail, snow and ice are very rare.

On the foothills of the Sierra, after a hight of about 1,500 feet is reached, also northward, in the Coast Range, the climate as we ascend approaches more and more that of the north Atlantic States.

At San Francisco ice is rarely seen, and the thermometer never stays at the freezing point twenty-four hours. Snow has not been seen, except a few flakes, for twenty-five years.

In the Sacramento and San Joaquin valleys the winters are about four degrees colder, and the mean temperature in the summer is from sixteen to twenty degrees warmer than that of San Francisco. The weather at mid-day is very warm during the dry season. In the southern part of the State the winters are milder and summers warmer. A temperature of 100 degrees in the southern and interior part of California, owing to the dry atmosphere, is more endurable than 80 degrees in the States east of the Rocky Mountains. Sunstroke is unknown.

The following table gives the results of observations at various points on the Southern Pacific Railroad, as compared with some of the world's noted climates:

MEAN TEMPERATURE.

PLACE.	JAN.	JULY	DIF.	LAT.
	Deg.	Deg.	Deg.	° ′
Austin, Texas	36	84	48	30.36
Borden, Cal	42	89	47	36.00
Cincinnati, O	21	77	56	39.06
Chicago, Ill	10	63	53	41.00
City of Mexico	52	63	11	19.26
Caliente, Cal	46	92	46	35.00
Delano, Cal	47	86	39	35.00
Dijon, France	33	70	37	47.00
Fort Yuma, Arizona	56	92	36	32.43
Genoa, Italy	46	77	31	44.24
Gilroy, Cal	41	78	37	37.00
Goshen, Cal	51	91	40	36.00
Honolulu, S. I	71	78	7	21.16
Hollister, Cal	48	73	25	36.00
Jacksonville, Florida	58	80	22	30.30
Los Angeles, Cal	55	67	12	34.04
Monterey, Cal	52	58	6	36.36
Milan, Italy	33	74	41	45.00
New York	31	77	46	40.37
New Orleans, Louisiana	55	82	27	29.57
Naples, Italy	46	76	30	40.52
Nice, France	47	75	28	43.00
Pajaro, Cal	49	58	9	36.00
Richmond, Virginia	73	77	44	37.00
San Francisco, Cal	48	58	10	36.36
Santa Barbara, Cal	56	66	10	34.24
San Diego, Cal	57	65	8	32.41
Sacramento, Cal	45	73	28	38.34
Stockton, Cal	49	72	23	37.56
San Mateo, Cal	46	59	13	37.00
San Jose, Cal	46	69	23	37.00
Salinas, Cal	47	65	18	36.00
Soledad, Cal	43	70	27	36.00
Savannah, Georgia	39	82	43	32.00
St. Augustine, Florida	59	77	18	30.05
Vallejo, Cal	48	67	19	38.05

The climate in the extreme northern part of the State is cold in winter and warm in summer, and is similar to that of the Eastern States.

The temperature of the coast is generally mild and pleasant in summer, but north of Santa Barbara is subject to chilly northwest winds. In winter the weather is chilly but not cold. The coast counties are subject to regular trade-winds and fogs for a distance of from six to ten miles inland. The fog at times is thick and wet, and is little less than a fine drizzly rain, beneficial to crops of nearly all kinds. These usually disappear about ten o'clock in the morning.

SEASONS.

The year is divided into two seasons, the wet and the dry. The wet season generally begins about the middle of November, sometimes a little earlier or later, and continues until April or May. There is occasionally a light shower in June or July. Between harvest and threshing time there is little danger of rain. Grain is often left lying in sacks upon the field for months, or until sold.

The wet season is much the pleasanter time of the year. It is called the rainy season, not because the rain falls continuously, but because it does not fall at any other time.

Plowing and seeding commence with the first heavy rains.

The average rainfall of the State is less than that of Liverpool and Rome, or of Chicago and St. Louis, and about the same as at Paris. In some localities, however, in the northern part of the State it is greater than in any of the places named.

The following table gives the average yearly rainfall by localities:

CITY OR TOWN.	COUNTY.	INCH'S.
Crescent City	Del Norte	34
Humboldt Bay	Humboldt	32
San Francisco	San Francisco.	23
Monterey	Monterey	15
Santa Barbara	Santa Barbara	14
Los Angeles	Los Angeles	12
San Diego	San Diego	10
Bakersfield	Kern	5
Fresno	Fresno	7½
Sacramento	Sacramento	19
Redding	Shasta	30
San Jose	Santa Clara	15

While it is raining in the valleys the snow is usually falling in the mountains. It is probable that as much snow falls on the mountains in the eastern and northern parts of the State as in any part of the United States. From the north part of Sonoma, Napa and Solano counties northward, light snows fall on the low lands every winter.

IRRIGATION.

If the rainfall is less than ten inches during any season irrigation is necessary. Although there are few localities in the State where the average rainfall for a long series of years does not exceed ten inches, yet, in nearly all the counties south of Sacramento and San Francisco, there are often years when it is less. In the San Joaquin Valley and further south in the State, irrigation is general. It is always beneficial, and when provided, adds much to the value of the land, and causes it to produce astonishing crops.

Artesian water, which is found at various depths in the valleys, varying from 50 to 350 feet, is largely used for irrigation purposes. Ordinary wells are sunk to a depth of from 10 to 50 feet almost anywhere in the State and abundant water is found.

HEALTHFULNESS.

The climate of California is generally considered conducive to health. The hills and mountains and their valleys are considered very healthy. In the low lands, where overflowed, there are at certain seasons some miasmatic diseases. But there are no diseases peculiar to California alone.

Portions of the State have long been visited as health resorts, particularly in the winter seasons.

Among the many places most noted as health and pleasure resorts, may be mentioned Los Angeles, San Diego, San Bernardino, Santa Barbara, Monterey, Santa Cruz, Napa, San Rafael, Santa Rosa and St. Helena. In the mountains, in different parts of the State, are many valuable mineral springs. These are much visited for pleasure and health.

TIMBER.

California produces many varieties of valuable trees which grow both on the mountains and in the valleys. The greater portion of the Sierra Nevada mountains is covered with timber. The oak, manzanita, nut-pine, and other varieties, grow to an elevation of about 2,500 feet above the sea, and dense forests of cone-bearing trees are found at an altitude of 6,000 feet. The redwood is the second tree in size in the State, and the first in commercial value. It is used for lumber, fencing, ties and fuel, and for all kinds of rough and fancy building. It grows on the coast from one to thirty miles inland, and the forests extend from the north boundary of the State to the south boundary of Monte-

rey county. The redwood tree is never found outside this State. The white oak grows to a considerable size, but it is of little value except for fuel. Laurel is one of the most beautiful trees of the coast, madrona the most striking. There are other valuable and beautiful trees in the State, such as the juniper, yew, walnut, cypress, poplar, willow, live oak, sycamore, buckeye, cottonwood, etc. The eucalyptus tree, or Australian gum, as it is sometimes called, when set out, grows in all the coast counties of the State most rapidly, and a grove of these in a few years becomes a forest. This wood is valuable for fuel.

SOIL.

The soil is much varied. In some of the valleys it is a loose, rich loam. In others it is an adobe soil which produces excellent crops when once under cultivation. The soil on the hills and mountains is rich and mellow, and is very easily worked.

The prairies are not covered with sod, and the first plowing is nearly as easy as the subsequent ones. The severe task of breaking prairie is not known in this State. The soil of the timber lands is similar to that of the timber lands in the Western States.

PRODUCTIONS.

The agricultural productions of California are more varied than those of any other State in the Union. The soil produces, with equal facility in the peculiar climates which are found here, the vines of continental Europe, the hardier cereals of North America, and the luxuriant fruits and flowers of the semi-tropics.

California is noted the world over for the excellent quality and size of her fruits.

The blooming of flowers in winter is the admiration of visitors.

Wheat, barley, oats, rye, buckwheat, Indian corn, broom corn and hops are extensively raised in nearly all parts of the State. California is the third largest exporter of wheat of all the United States. In quality California wheat is harder, dryer and stronger in gluten than that grown elsewhere in the United States. Fruits, barley, honey, wool and hides are exported in large quantities.

The State is also noted for its rich gold, silver and quicksilver mines, and is well supplied with coal, iron, copper, stone, and marble.

Garden produce of all kinds is easily raised everywhere. Peas, beans, onions, potatoes, pumpkins, squashes, melons, tomatoes, beets, carrots, radishes, cabbages, celery, sweet potatoes, etc.

The apple, pear, quince, peach, plum, prune, cherry, apricot, nectarine, olive and other fruits, and the English walnut, almond, chestnut and peanut thrive exceedingly well.

Blackberries, strawberries, raspberries, gooseberries, currants and other small fruits do well in very many parts of the State. The grape, both for wine and raisins, does exceptionally well, and raisins are competing successfully with the best brands of Malaga. France is also yielding the palm to California for the excellence of her wines.

The orange, lemon, lime, fig, pomegranate, etc., grow luxuriantly in the southern gardens and orchards. The fig does well as far north as Sacramento.

Tobacco and cotton are grown in the southern part of the State, and both promise to become important productions.

It has been demonstrated beyond question that California is well adapted to the raising of silk. Its equable climate and the rapid growth of the mulberry tree have proved in various parts of the State that the rearing of the silkworm will become an important branch of industry. It requires little or no capital, and can be carried on by the women and children of the family as an addition to other farm work. None of the diseases which have affected the worm in Europe have ever appeared in this State. Samples of the silk raised here have been sent to England, France and Italy, and the manufacturers have expressed the opinion that it is equal to that produced in the most noted districts of Japan and Asia Minor.

Alfalfa often produces three and even four crops of hay in a single season, and is considered invaluable for stock.

The climate is so mild that all vegetable life in ordinary seasons is almost as active in January as in July. Trees and shrubs have nearly twice as much time to grow and mature as in the Atlantic States.

DOMESTIC ANIMALS.

Horses, mules, cattle, sheep, goats and hogs are raised in every part of the State, and south of San Francisco can live through the winter months without shelter and without cultivated food. Fine blooded stock of all kinds has been introduced, and many farms are devoted specially to raising blooded animals. There are blooded stock farms in California unsurpassed in the world. Nutritious grasses grow voluntarily in abundance in the valleys and on the foothills and mountains during the wet season, and retain their nutritious qualities when dried by the summer sun; these make excellent feed for horses, cattle, sheep and hogs during the dry season. The late fall and early winter in California is the feeding season for stock when feeding is necessary.

MARKETS.

Good markets are to be found for all productions in the State. The mining districts furnish markets for farmers and fruit raisers situated within easy reach by wagon. Farming is generally profitable in this State, as elsewhere. Wheat, barley and various other crops can usually be sold on the land where produced, to the agents of millmen and shippers, who traverse the country making purchases. Wheat is shipped to Europe by sailing vessels. Fruits, honey, wool and hides are shipped to the Eastern States and cities by the overland railroads. The Southern Pacific railroad has also commenced carrying wheat, flour and other productions to New Orleans and the Southern States.

RAILROADS.

Although it is but thirty-five years since the discovery of gold in California, at which period the State was a vast wilderness, yet in that short time the progress of civilization has been rapid and permanent. Railroads have kept pace with the increase in population, and there are now twenty-three railroads in operation, including the main trunk lines and their branches, and many others are contemplated. Those in operation are the Central Pacific, main line; Central Pacific, Oregon division; Central Pacific, Western division; Central Pacific and Amador Branch railroad; Southern Pacific, Northern division; Southern Pacific, Tulare, Los Angeles, Yuma and Wilmington divisions; Los Angeles and Independence; California Northern; California Pacific and Northern Railway; Nevada County Narrow Gauge; North Pacific Coast; Northern Railway and Berkeley Branch; Northern Railway and San Pablo and Tulare Railroad; Sacramento and Placerville; San Francisco and North Pacific; San Luis Obispo and Santa Maria; Santa Cruz; South Pacific Coast; Stockton and Copperopolis; Vaca Valley and Clear Lake.

SCHOOLS, CHURCHES, AND BENEVOLENT ASSOCIATIONS.

Our common schools are the pride of the State. Free education is provided; so that it is within the reach of all. Wherever fifteen children can be gathered to form a school, it is entitled to support at the public expense.

In the large towns are first-class high schools. There are also a number of academies and colleges, some of them first-class institutions. There are also military, medical and theological schools. San Francisco supports three commercial colleges. Besides these are the State Normal School and the University, both supported by the State.

The leading church denominations are well established.

In all the leading towns the principal benevolent associations have organizations.

LANDS.

Private lands vary in price from two dollars and fifty cents an acre for unimproved lands remote from towns, to ten dollars an acre near towns; and from ten dollars to one hundred dollars an acre for improved land, according to value of improvements and proximity to large or small towns.

The IMMIGRATION ASSOCIATION is searching the United States Land Office records in California, to ascertain the exact location and quality of the millions of acres of vacant Government lands in the State, for the purpose of aiding immigrants to locate on them with the least possible expense and loss of time. There are Government lands in every county in the State, with two or three exceptions, but as to quality and exact location this Association has much yet to learn.

Title to the Government lands may be acquired under the Homestead, Pre-emption, Timber and Timber Culture laws.

HOMESTEAD LAW.

The word homestead, as now applied in the United States, signifies a tract of land given away by the Government as a free gift forever, on the single condition that the person accepting the gift shall live upon the land and cultivate it, and make it his home for five years. Any citizen of the United States, who is the head of a family, or an unmarried person over the age of twenty-one years, is entitled to a homestead of 160 acres. Persons of foreign birth may avail themselves of the benefit of this law by declaring their intention to become citizens; and this they can do immediately after their arrival in this country.

A person wishing to enter a homestead must go to the United States Land Office of the district, or to the Clerk of the county in which the land he wants is located, and file his application and affidavit in accordance with legal forms which will be furnished him by the Land Office. The Land Office fees are from $16 to $22, which must be paid at the time of filing the application. Within six months after filing his application at the Land Office the settler must commence living upon and improving the land, and thereafter, for five years, he must make the tract his actual home. A soldier who served not less than ninety days in the army during the late rebellion is required to live on the land five years, less the time he served in the army. At the expiration of five years, or within two years thereafter, on making proof at the Land Office by two competent witnesses, that he has complied with all the requirements of the law, and paying an additional fee of from $6 to $12, he will receive from the Government a complete and absolute title to the land.

Homesteads, until the issuing of the patents, are *free from taxation*, and cannot be taken away or sold for debt, but are absolutely secure to the settler so long as he *occupies and cultivates the land.*

If at any time after six months the homestead settler should desire to get a full title to his land he can do so by making proof of settlement and cultivation up to date, and paying the Government price of $1.25 or $2.50 per acre for the land, according to location—that is, within or without the boundary lines of railroad grants.

PRE-EMPTION LAW.

Any person qualified to take a homestead is also entitled to 160 acres under the pre-emption law (but not at the same time.) Within ninety days after settlement on the land he must file his application in the District Land Office where the land is located, which will cost $3. At any time after six months' settlement and up to thirty months after filing his application, the settler may pay for the land at the rate of $1.25 or $2.50 an acre, according to location.

TIMBER CULTURE LAW.

Under the timber culture act an applicant is entitled to 160 acres on any section naturally devoid of timber; the whole section must be devoid of timber. On one section, only one timber claim can be taken. It requires eight years to acquire a title. Actual residence is not required. The first year five acres must be broken. Second year must cultivate this five and break five more. Third year must plant the first five acres in trees and cultivate the second five acres. Fourth year plant the second five acres in trees, which make the ten acres. On the day of final proof 675 trees must be living and in a thrifty condition on each acre.

CAPITAL NECESSARY FOR NEW COMERS.

The question arises as regards the smallest sum considered necessary for a new comer to start with. An industrious man may come here almost without a dollar, hire out for some years, and work his way up by strict economy. But those who come here to make homes for themselves should have $500 to $1,000 to start with on even the cheapest foothill lands. There will be some years of close effort. Poultry must be kept, vegetables raised, odd jobs of work done for the neighbors. But thus, on even this small capital, a valuable property can be developed in the course of eight or ten years. A small piece of good land is better than a large piece of poor land. It is best to purchase only as much land as can certainly be paid for. Develop this thoroughly, and make it profitable, and more land can be had at some future time. Many failures have arisen from attempting too much. The new settler who deserves success, begins at bed-rock, keeps out of debt, buys as little as he can, wears his old clothes, works early and late, plants trees and vines for the future, leaves whisky alone, and has a definite aim and plan in life. Such a man can come to California with a small capital and find it a "good State for the poor man." Those who are content to work and be patient here will find the reward sure and ample. Is it not worth while to have a home in a land where there are no violent extremes of heat and cold, and where the farmer can work in comfort every month in the year?

WAGES.

Wages for ordinary day laborers range from $1.50 to $2.00 per day; good labor, requiring familiarity with the work in hand, brings $2.50, and skilled workmen, such as machinists, jewellers, etc., receive $3 and $4, and even more per day. Masons, carpenters, stone-cutters, etc., $3.50 to $4.00 per day. Harvest hands (with board), $2 and upwards. Regular farm hands, with board, per month, $20 to $30.

Wearing apparel is about as cheap as in the Atlantic States.

The following is a list of prices of some of the most important articles of immediate use to immigrants:

HOUSEHOLD GOODS.

Cooking stoves, furniture complete, $15 and upwards.
Tinware, about the same as Eastern prices
Queensware, same as Eastern prices.
Tables, $2 and upwards.
Chairs, 60 cents and upwards.
Bedsteads, $3 and upwards.
Common carpet, two-ply, 75c to $1.25.
Common carpet, three-ply, $1.25 to $1.50.

FARMING APPLIANCES.

Wagons, $100 to $175.
Harness, $10 to $40.
Plows, $7.50 to $22.
Mowers, $100 to $150.

STOCK.

American farm horses, $75 to $150.
Half-breed and Mexican horses, $15 to $75.
Milch cows, $25 to $75.
Hogs, $5 to $6.
Sheep Ewes, $1.50 to $5.
Rams, $10 to $50.

FRUIT TREES AND PLANTS.

Apple—1 and 2 years old, per 100, $12.50 to $50.
Pears—1 and 2 years old, per 100, $25 to $35.
Cherries—1 and 2 years old, per 100, $25 to $35.
Peach—1 year old, per 100, $20.
Plum and prune—1 and 2 years old, per 100, $20 to $35
Apricots—1 and 2 years old, per 100, $25 to $35.
Nectarines—1 and 2 years old, per 100, $25 to $30.
Quinces—1 and 2 years old, per 100, $20 to $35.
Figs—1 and 2 years old, per 100, $20.
Oranges and lemons—1 and 2 years, from graft, each 75c to $1.50.
Persimmon—1 and 2 years, from graft, each 75c to $1.50.
Olives—each 50c to 75c.
Pecan—each 50c.
Almond—per 100, $20 to $25.
Filberts—each 50c.
Chestnut—each 50c to 75c.
English Walnut—each 25c to 50c.
Grapes—Foreign, per 100, $6.
Grapes—Raisin, per 100, $10.
Currants—per 100, $6.
Gooseberries—per 100 $5 to $6.
Blackberries—per 100, $3.
Raspberries—per 100, $3.
Strawberries—per 100, $2. (and special rates for greater number)

OTHER TREES.

Blue Gum—per 100, $2 to $5.
Mulberry—each 75c.

FRUIT TREE STOCKS.

Pear—grafting size, per 1,000, $10 to $12.
Apple—grafting size, per 1,000, $12.
Cherry—grafting size, per 1,000, $12.
Plum—grafting size, per 1,000, $30.
Scions—pear, apple, plum and cherry, per 1,000, $5.

Trying to Steal our Climate

We object to spreading the climate of the Pacific coast all over North America. Climate is one of our peculiar "resources," and if ethereal mildness is made too common, its value will no doubt greatly depreciate. And yet, if we understand reports aright, an eastern meteorologist, with a taste for the vast in engineering, proposes a plan which will distribute the warmth of a California winter all over the continent, and perhaps rob us of what will not enrich him, while it may make us poor indeed. This is the plan to accomplish it: Professor Shaler, of Harvard University, has a dazzling scheme in his head which he has only to realize to give the entire American continent a brand new cosmopolitan climate. Professor Shaler's invention is explained in brief by a contemporary as follows: "Once on a time the Japanese current flowed through Behring's Straits into the Arctic ocean. Then the Straits were wider than they are now, because forces no longer existing caused the coast to gradually rise. The result of the narrowing process was the interruption of the warm current. The thing to do is to make an artificial channel through the Straits, so that the warm current may pass to ward the Pole again. Such an achievement would reclaim a vast stretch of land, giving North America a delightful climate, dispelling the rough winters and tempering the fierce heats of the summer."

All that has to be done is to widen Behring's Straits—perhaps lop off Alaska, or half of it, if the Russians could be persuaded to give enough of Siberia to make the project a joint one between the two countries. Thus set in the flow of the warm current, thaw the ice off the Pole, put it under bonds not to disappear, so that no more Arctic expeditions may be called for, and at the same time secure a climate which will lead to planting orange groves around Hudson's Bay. This will be fine enough if the change in the Pacific currents does not set the glaciers at work again in California. It is a beautiful scheme, but dangerous.

BRONZING IRON.—Iron has sometimes to be bronzed for domestic use. The following is a very simple way of obtaining a very good bronze: Mix an equal quantity of butter of antimony and oil of olives; put this mixture on the iron which is required to be bronzed, with a brush, the iron having been previously brightened with emery and cloth, and leave it for several hours. Then rub with wax and varnish with copal.

GAS-FITTERS have recently made a most useful application of photography. They photograph the gas flames given by different burners or jets, so that a customer can see if the shape and form of a light will suit him before he gives his order. As the flames are moreover depicted "life-size," the purchaser can always tell whether his jet is up to the standard.

MINING AND SCIENTIFIC PRESS.

A. T. DEWEY. W. B. EWER.

DEWEY & CO., Publishers.

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DEWEY & CO., Patent Solicitors.

A. T. DEWEY. W. B. EWER O. B. STRONG.

SAN FRANCISCO:

Saturday Morning, April 22, 1882.

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Passing Events.

Men are beginning to crowd ahead for the Idaho and Montana mines, in spite of the fact that it will be several weeks yet before the snow is gone. All who are in Butte and Wood River unite in telling people to be careful about coming without money to maintain them; for while prospecting is brisk and lively, very many men cannot get work by the day in the mines.

The loss of the Arctic relief expedition vessel, *Rodgers*, near Cape Serdze, of which we have just heard, is only another evidence of the futility of Arctic research. Fortunately, in this case no lives were lost. The opinion strengthens every day that poor De Long, of the *Jeannette* expedition, has perished with that portion of his party with him.

The water is beginning to run in many of the ditches leading to the mines, and every week more and more mines are started up.

The outlook in California for the coming season is good, and provided there is no adverse decision in the debris case, this State will produce a very much larger amount of bullion than it did last year.

THE bullion output of the Columbus mining district averages from $25,000 to $33,000 per week.

THE land department of the Northern Pacific Railroad Company answered in March 3,000 letters of inquiry from prospective immigrants.

OVER 16,000 European immigrants landed in New York during the week ending April 8th.

Production of the Precious Metals.—No. 5.

[An abstract of the Census Monograph on the Bullion output of the country.]

The average product of the Utah milling ores and ores smelted, and the average yield of all the Utah ore reduced by either process during the census year, was as follows:

UTAH—Comparative Results of Treatment.

	Average yield of—		
	Ores milled.	Ores smelted	All ore treated.
Gold per ton	$ 2.33	$ 1.40	$ 1.90
Silver per ton	29.02	34.78	33.24
Total	$32.25	$36.18	$35.14

The next table shows the base bullion product of the Utah smelting works, with the precious metal contents. It includes the yield of ores sent from Idaho, Montana, and Nevada to the Utah smelters, and also the product of a small quantity of ore which was raised prior to the census year.

Deducting from the crude bullion product 322,170 lbs., produced from Idaho, Montana, and Nevada ores smelted in Utah, the remainder, 27,891,331 lbs., is the yield of Utah ores smelted in the Territory. To this should be added 865 500 lbs. of crude lead bullion, the estimated yield of Utah ores smelted in Chicago and Omaha. The total crude bullion product of Utah for the census year is, therefore, 28,756,831 lbs.

UTAH—Bullion Produced from Utah Ores and Matte Treated Elsewhere than in the Territory.

Ore and matte shipped to Chicago and Omaha	Assay value.			Estimated product, to be included in total production of Utah.		
	Gold.	Silver.	Total.	Gold.	Silver.	Total.
Tons.	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.
1,180	1,922	64,243	66,165	1,730	57,810	59,540
241	.....	15,579	15,579	.....	14,801	14,801
1,421	1,922	79,822	81,744	1,730	72,620	74,350

From the preceding tables the following *resume* is derived:

UTAH—Resume.

Classification of product.	Bullion.		
	Gold.	Silver.	Total.
	Dollars.	Dollars.	Dollars.
Bullion product traceable by districts from Utah ore raised during census year	184,104	2,922,481	3,106,585
Bullion product traceable by districts from Utah ore raised prior to census year	1,542	145,902	147,504
Net bullion product from Utah ores sold to and treated by Utah smelting works during census year	$4,079	1,601,850	1,685,935
Estimated bullion product of ores and matte shipped to Chicago and Omaha during census year	1,730	72,620	74,350
Product of Placer mines (in West Mountain district, Salt Lake county) during census year	20,000	.....	20,000
Total	291,555	4 742,919	5,034,474

ARIZONA—Production of Dsep Mines for the Year Ending May 31, 1880.

COUNTY.	Ore raised during census year.	Average assay value per ton.			Total assay value of ore raised during census year.		
		Gold.	Silver.	Gold and Silver.	Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Maricopa	1,989.00	1.51	114.43	115.94	3,000	227,600	230,600
Mohave	2,618.50	10.79	84.20	95.09	28,260	220,739	248,996
Pima	27,838.00	9.74	76.82	86.56	246,850	1,946,368	2,193,218
Pinal	1,291.00	21.33	31.60	52.93	25 6 80	37,950	63,570
Yavapai	6,600.00	4.41	123.70	128 11	*29,125	816,450	845,575
Yuma	1,930.00	3.56	35.49	39.05	6,875	68,488	75,363
Total, as derived from schedule data	39,676.50	8.56	83.61	92.17	339,730	3,317,592	3,6 7,3.2
Additional production, estimated	*3,576.00	*9.30	*114.99	*124.34	*80,163	*936,153	*1,0 66,316
Total production, estimated	*43,252.50	*8.70	*89.13	*97.89	*419,893	*4,303,745	*4,723,638

COUNTY.	Ore raised and treated.	Average yield per ton.			Bullion produced from ore raised and treated during census year.		
		Gold.	Silver.	Gold and Silver.	Gold.	Silver.	Totals.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Maricopa	264.00	.....	376.44	376.44	.....	99,381	9+,381
Mohave	893.00	10.36	114.4	124.85	9,250	102,248	111,498
Pima	12,443.50	9.74	76.82	86.56	94,743	807,122	902,870
Pinal	119.75	21.09	40.33	61.42	2,5 6	4,824	7,+53
Yavapai	3,223.00	3.32	144.79	148.11	10,7 0	466,650	477,350
Yuma	204.00	5.00	.....	5.00	1,020	.....	1,020
Total, as derived from schedule data	17,152.2+	7.01	86.24	93.25	120,244	1,479,230	1,599,474
Additional production, estimated	*8,576.00	*7.01	*86.24	*93.25	*60,122	*739,615	*799,737
Total production, estimated	*25,728.25	*7.01	*86.24	*93.25	*180,366	*2,218,845	*2 399,211

*Estimated.

UTAH—Base Bullion Production of Smelting Works for the Year Ending May 31, 1880.

County.	Refined Lead.	Crude bullion, including weight of silver and gold contents	Precious metals contained in base bullion.		Totals.
			Gold.	Silver.	
	Pounds	Pounds.	Doll's	Dolla rs.	Dollars
Beaver	.....	8,3+2,957	9,180	675,472	684,652
Salt Lake	2,586,370	16,781,778	77 1+5	1,499,225	1,576 360
Tooele	.....	3,118, 66	6,944	170,5o2	1,7,+46
Total	2,586,370	28,213,501	93,259	2,345,199	2,438,458

The gross precious metal product of the Utah smelting works, given in the preceding table, is segregated as follows:

UTAH—Product of Ores Smelted in Utah during the Year Ending May 31, 1880.

	Bullion.		
	Gold.	Silver.	Total.
	Dol's	Dollars	Dollars
Product of smelting works (precious metals contained in base bullion)	93,259	2,345,199	2,438,456
Deduct product of Beaver County smelting works	9,180	675,472	684,652
Product of smelting works, less product of Beaver County smelting works	$4,079	1,669,727	1,753,8.6
From this deduct: Dollars.			
Product of Nevada ores smelted in Utah (a)	19,386	.....	.....
Product of Idaho ores smelted in Utah (b)	21,870	.....	.....
Product of Montana ores smelted in Utah (c)	6,615	.....	.....
Product of Nevada sulphides or leaching works	20,000	.....	.....
Total	67,871	67,871	67,871
Net product of Utah ores smelted in Utah during census year	$4,079	1,601,856	1,685,935

(a) 359 tons containing 25% lead. Estimated product, 80.775 tons lead.
(b) 162 tons containing 45% lead. Estimated product, 65.61 tons lead.
(c) 49 tons containing 30% lead. Estimated product, 14.7 tons lead.

In addition to the bullion product from ores which were treated in the Territory, there was also considerable yield from ore and matte shipped to Chicago and Omaha and reduced at these points. As nearly as ascertainable this additional product was:

Utah Placer Gold.—The small placer product of the Territory ($20,000 in the census year) was from West Mountain district, in Salt Lake county.

Market Value of Utah Base Bullion.—The gold and silver contents of the base bullion are sold at a price which allows for the refining charge on each metal, with, of course, the market discount on the silver. Thus the gold contents brought from $19 to $20 per ounce, and the silver an average of $1.10 per ounce during the census year.

The average price of refined lead at Salt Lake City during the same period, was 4¾ cents per pound, and that of unrefined lead $47.50 per ton.

Market value of 2,586,370 lbs of refined lead	$122,853
Market value of 28,756,831 lbs unrefined lead	682,975
Total	$805,828

This represents roughly the value at the seaboard, after deducting freight charges, commissions, etc. There were also $14,160 worth of copper sold, the product of Utah ores worked for the extraction of the precious metals. Adding the market value of the lead and copper, all of it an accessory product of the precious-metal industries, to the mint value of the precious metals, the total product of the Utah mines is raised to $5,854,462. This does not include the value of iron ore sold for flux, and some other small items.

ARIZONA.

A marked impulse has been given to the mining industry of Arizona, by the fine showing of the new Tombstone district, in Pima county. The bullion production of this district had only begun in the period covered by the census year. A few months later, with increased milling facilities, a considerably higher rate of production was maintained.

Placer Mines.—The schedule data include 798.2 ounces, or $16,500, of gold from the Arizona placers, to which are added 653 ounces, or $13,500, by estimate, bringing the total product from this source up to 1,451 2 ounces, or 30,000. This was chiefly derived from Yavapai county.

(TO BE CONTINUED.)

The Little Giant Controversy.

Mechanical and Legal History of Hydraulic Nozzles.

A curious legal contest which has, for a number of years, been waged over a patented machine, has recently been decided by Judge Sawyer, of the United States Circuit Court, District of California. It involved the title and ownership of the famous hydraulic mining machine known as the Little Giant, heretofore made and sold by Richard Hoskin, of Marysville, Cal., but which was formerly made and sold by R. R. & Joseph Craig, of Nevada City. This machine has done more to encourage and develop the hydraulic mining industry of the world than all other causes. It solved the problem of practically handling large streams of water under great pressures, which is a necessity in working our large hydraulic claims on a profitable scale.

Some of our readers may not understand the nature of the work that such a machine is called upon to perform. Some idea may be gathered from a mere statement of the circumstances under which they are used. In some of our large mines the reservoir from which the water is taken is 300 ft. above the point where the water is to be used, and the water is conducted from this reservoir to the Little Giant, or hydraulic machine, through large sheet-iron pipes, which in some cases are two ft. in diameter. Before the water reaches the Little Giant it is under an enormous pressure, and it issues from the nozzle of the machine with such force that it is projected in a solid stream from 100 to 150 ft. against the bank to be washed and literally carries all before it. So compact and solid is the stream near where it issues from the nozzle, that a person could no more strike a heavy crowbar through it than he could through an equal body of iron or steel. Sometimes the banks are very high, in which case the Giant must be kept at a respectful distance from it, otherwise it is in danger of being buried when the bank caves or falls in.

The usual method of attacking a bank is to direct the stream at its base and wash out or burrow a tunnel so as to cut in under the bank until the upper portion falls or caves down in a broken mass. The stream then cleans up the debris which has fallen and washes it into the flume, down which it courses, depositing its particles of gold in the riffles which are distributed over the bottom of the flume.

Hydraulic mining was first carried on by conducting the water through an ordinary two-inch hose and projecting it through an inch nozzle, such as are now used by our fire department for conducting water from fire engines and throwing it upon a fire. This was necessarily slow business, as the stream would do but little execution against a tough cement bank. There was no scarcity of water, but there was no competent machine for handling a large stream. Even with a small hose and nozzle, such as we have described, the labor of holding and directing the nozzle was almost Herculean. The hose had a tendency to fly from side to side, especially when it got a little bent, and the nozzle-man was a lucky one indeed that didn't get thrashed by his pipe and nozzle several times a day. In 1864, J. M. Allenwood, of Timbuctoo, Yuba county, patented what was afterwards known as the "Gooseneck machine." It had two joints; a lower horizontal joint and an upper joint made of a short section of canvas. This machine was one step in the right direction, but the canvas joint was liable to get "kinked," and then the machine would fly around like a whirligig and knock everything over within its reach. This the miners called "bucking." The machine was, however, used in several mines by using a block and tackle for holding it to its work.

In 1867, Jenkin W. Richards, of Michigan Bluff, Placer county, devised a double-jointed machine to take the place of the usual nozzle. It was intended, with this machine, to get the desired range of motion from the two joints, and thus avoid the necessity of bending the hose in order to change the direction of the stream.

This machine never amounted to much, as its joints were found to be almost as unreliable as the hose. It was, therefore, abandoned as a failure, and inventors came to the conclusion that two-jointed machines would never answer.

In 1869, the Craigs—R. R. and Joseph—above mentioned, devised and patented a single-joint, ball and socket machine, which it was at first supposed would answer every purpose. Other inventors followed, all with single-jointed machines—except in one or two instances, where some sanguine inventor would bring out a non-descript two-jointed machine to be tested and then taken back to the foundry to be broken up for old iron. Such was the Shaw, the Rice, the Gorman and Hoskin and a number of others.

In 1870, Frank H. Fisher, of Nevada City, invented his famous "Hydraulic Chief." This was a two-jointed machine, and the first successful two-jointed machine that any one had produced. Its element of success was in its upper joint. Instead of the canvas or hose section used in the Allenwood machine, he substituted a metallic joint that worked on pivots on both sides, so that the nozzle could only be moved up and down on this joint, while it got its side motions from the horizontal, or lower joint. This machine was a success, and it became quite popular for the short time it had in the field. In the meantime the Craigs com-

menced suit against several of the machines, Hoskin amongst the rest, and threatened Fisher with a suit, alleging that all of the machines were infringements upon their Globe, or hall and socket single-jointed machine.

Instead of contesting the case with the Craigs, Hoskin compromised his suit with them and entered into a compact with them by which Hoskin was to be the manufacturer and seller and the combination was to drive out competition and control the market. Hoskin then got up the present Little Giant, which was simply a duplication of Fisher's Hydraulic Chief, with slight changes. They also purchased from the inventors, Macy & Martin, a patent which covered the use of riffles in a hydraulic discharge pipe. This "riffle" patent was the key to the situation. Without the riffles none of the machines could be successfully used, and all of their machines were using them. Craig then commenced suit against Fisher in the United States Circuit Court to prevent him from using the riffles and served a preliminary injunction on him *pendente lite*. Fisher was contumacious, and persisted in using the riffles, even after the injunction was served, and as a consequence he was brought before the court on an order to show cause why he should not be punished for contempt of court. Judge Sawyer, after due consideration of the case, fined Fisher $100 and gave him a severe lecture on the danger and possible consequences of violating an order of the court, and warned him to desist in the future from committing any further contempt. Fisher was not altogether subdued by this fine and lecture, but returned to his home in Nevada City, determined to get around the Craigs and the order of the court in some way; but, nevertheless, he did not act without the advice of his counsel. His business was in jeopardy unless he could use riffles in some way in his discharge pipe, because, without the riffles the water which issued from the nozzle would scatter and be ineffectual. He therefore purchased a number of old, worn-out pipes in which riffles had been placed by Macy & Martin, the inventors, and, taking out the riffles, placed them in the new discharge pipes of his Hydraulic Chief.

Again he was brought before the court for contempt, and Judge Sawyer, after considering the case, rendered the decision which has ever since been recognized as authority in like cases, viz: "In a combination of two elements it is an infringement to manufacture one of the elements and combine it with the other element, although the other element is purchased from the patentee himself." Fisher was therefore found guilty of a contempt of court.

This being the second offense, Fisher was fined $500 and ordered to be confined in the San Jose jail for 30 days. Fisher says his confinement was not irksome and not altogether without enjoyment. He spent most of his time in a steeple, with a spy-glass in his hand, from whence he became quite familiar with the landmarks around the bucolic city of San Jose. The balance of his time he spent on parole, wandering through the streets and taking needed exercise. After his release he one day happened into the MINING AND SCIENTIFIC PRESS Patent Agency in this city, where he was informed by Mr. Jno. L. Boone, who was at that time connected with the agency, that his patent could be reissued so as to cover the upper joint of the Little Giant machine. Munn and Co., of New York, had taken out the original patent, but had only patented the lever attachment by which the machine was handled. A reissue of his patent was then applied for, through the MINING AND SCIENTIFIC PRESS Patent Agency, and in due time the new patent was issued with a claim for the upper joint. Fisher then employed the law firm of Morgan & Heydenfeldt, and a suit was commenced against the Craige for injuring the reissued patent.

Meanwhile the Craigs had not been idle. They had purchased the old Alleuwood patent of 1864, and immediately they reissued it so as to cover broadly a two-jointed machine. With this patent they went into court, and defeated Fisher's suit by anticipating his invention with the Allenwood machine. This put a quietus on Fisher. He had become deeply involved financially in his several battles with the Craigs, and it now became necessary to seek other means to afford him a livelihood. He obtained employment in the San Francisco Mint, where he has remained ever since. About two years ago, he again reissued his patent with good success, and he then employed our friend, Jno. L. Boone, Esq., who had meanwhile commenced the practice of law, to commence another suit against Hoskin and the Craige. This suit was contested on the part of Craigs by the same attorneys who had successfully defeated the former suit, and the case was prosecuted before the same Judge. This time, however, Fisher was successful, and a decision was rendered in his favor in the early part of the present term, and as the Macy & Martin patent on the riffles has expired, Fisher now succeeds to his legitimate rights, and will hereafter furnish hydraulic mining machines.

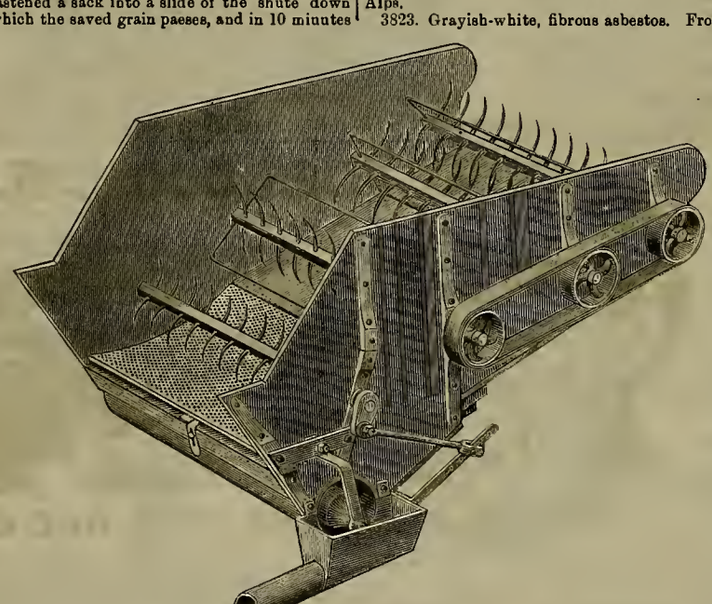
SOME prominent citizens of Chico, are discussing the project of building a narrow-gague road from that place to the Sacramento river, to furnish better facilities to farmers and horticulturists to get their produce to this market.

THE Red Rover mine, in Magazine district, is attracting a great deal of attention just now. It is about 42 miles northeast of PHŒNIX. The vein is stated to be 14 ft. wide, with streaks of remarkably rich ore running through it.

McLean's Grain-Saving Attachment.

We give on this page an engraving of a device of which we have received many good accounts from those who saw it in operation at the last harvest. It is an attachment, as is seen in the engraving, which manipulates the straw just before it goes over the end of the straw carrier. It is styled McLean's Straw Agitator and Grain-Saving Attachment. The agitator consists of three beaters situated near the end of the straw carrier, and worked by a two-inch belt. The straw, after it leaves the machine, is taken by these beaters and "agitated"—that is, the beaters, being constantly in motion, beat upon the straw as it passes over the carrier. The long straw is carried over, and the shorter straw, chaff and grain fall down on a sieve, which, by means of a crank, is kept in steady motion. The grain falls through the sieve into a semi-cylindrical box, and the chaff and straw work over the sieve and fall to the ground. In the apartment in which the grain falls, works a "worm," which forces the grain out into a shute, down which it passes into the main elevator, and from thence is carried on to the sheds, and the grain passes finally, with the other grain, out the grain shute. The attachment is simple, small and compact, and works easily. The beaters extend across the carriers, and though apparently weak and small, do their work effectually.

The editor of the Watsonville *Pajaronian* was present upon one occasion when tests were made of its efficacy, and his report was as follows: "While we were watching the attachment, Charlee Knapp and the writer fastened a sack into a slide of the shute down which the saved grain passes, and in 10 minutes



MCLEAN'S STRAW AGITATOR AND GRAIN-SAVING ATTACHMENT.

saved a bag full of fine straw, chaff and wheat. Afterwards the mass was cleaned, and the result was six lbs. of wheat—wheat which without the use of this attachment would have gone over into the straw pile. Six lbs. of wheat in 10 minutes is the lowest saving yet made with this attachment, and twice that quantity of barley or oats has been and can be saved, the machines' loss on those grains being greater than on wheat. Six lbs. of wheat in 10 minutes is at the rate of 36 lbs. an hour, or about 450 lbs. a day, quite an amount (at least worth $5) to save in a day, and conclusive proof that the straw agitator and grain-saving attachment is a complete success, and is something of great value to farmers.

During the coming harvest Mr. McLean's attachment will be used in different parts of the State, as he has received orders from threshermen who have heard of its work. Any further information which may be desired may be had by addressing N. McLean, Watsonville, Cal.

BUTTE.—The following extract is taken from a letter received by a gentleman of Ruby Hill: "Butte is quite a place. There is a large amount of building going on, and the immigration is immense, the cars being filled on each arrival. Those who come with the intention of getting employment will wish they had staid away. Already many are pleading hunger for the purpose of getting work. Most of the travel coming in from the East and Nevada, and it is reported that many more are coming. I would advise my friends to stay where they are. The show to get work for wages is slim, but for those wishing to prospect this is a good country."

A PRIVATE letter from an American traveler in Siberia strengthens the impression that Commander De Long and party have perished from hunger and cold in the delta of the Lena. The traveler met Danenhower, and, by his conversation, was led to the conclusion that the chances of finding the De Long party alive were very slim.

Italian Rocks and Contained Minerals.

(Continued from last week).

3813. Opaque, porcelain-white, semi-opal, passing insensibly in this specimen into sepiolite or Meerschaum. Caselette (Turin). Val. di Susa, Cottian Alps.

3814. Euphotide, containing crystals of brouzite; forms veins in the serpentine (see No. 3804); from immediate vicinity of the veins of giobertite. From the Mussine, Caselette (Turin). Val di Susa, Cottian Alps.

3815. Euphotide, containing large crystals of diallage, felspar, saussurite in proximity to former specimen, in serpentine. Caselette (Turin). Val di Susa, Cottian Alps.

3816. Compact white giobertite, forming reticulated veins in the midst of serpentine. Baldissero, Canavesa (Turin). Val Chiusella, Graian Alps.

3817. Bluish-white and dark-brown semi-opal, from the serpentine. Campo Canavesee (Turin.) Graian Alps.

3818. Semi-opal, of various beautiful tint from the serpentine. Campo Canavese (Turin). Graian Alps.

3819. Dark-green serpentine, somewhat greasy on the plane of fracture, and without distinct indications of stratification. Germagnano (Turin). Valle Grande di Lanzo, Cottian Alps.

3820. Bluish-gray steatite, forming stratified deposits in serpentine. Germagnano (Turin) Valle Grande di Lanzo, Cottian Alps.

3821. Greenish-white, aqua-marine colored steatite. Germagnano (Turin). Valle Grande di Lanzo, Cottian Alps. Found in the serpentine rocks.

3822. Light-green serpentine schist. Valtournanche (Turin). Val Tournanche, Pennine Alps.

3823. Grayish-white, fibrous asbestos. From the serpentine. Chatillon (Turin). Val d'Aosta, Pennine Alps.

3824. Fibrous amianthus. From fissures in the serpentine. Western Alps.

3825. Silky, white, fibrous amianthus. Found in the serpentine, generally between the walls of fissures or planes of fracture. Useglio (Turin). Valle di Viu, Cottian Alps.

3826. Silky amianthus, in long fibres of great beauty. Useglio (Turin). Valle di Viu, Cottian Alps.

3827. Silky amianthus, formed of masses of short fibres, matted together like felt. From the serpentine rocks. Useglio (Turin). Valle di Viu, Cottian Alps.

3828. Fine-grained magnetite. Constitutes stratified deposits without proper walls in the serpentine rocks. Champ-de-Praz (Turin). Val d'Aosta, Graian Alps.

3829. Massive magnetite. Larcinaz iron mine, Cogne (Turin). Valle di Cogne, Graian Alps. Forms very important stratified deposits in the midst of serpentine rocks. Is smelted with charcoal, and produces the most excellent iron for steel manufacture.

3830. Red jasper. Issiglio (Turin). Val Chiusella, Graian Alps.

3831. Garnetiferous talcose rock, formerly much used for making mill-stones. La Molera. Locano (Turin). Valle dell 'Orco, Graian Alps.

3832. Magnetite. Rich ore of the best kind. Traversella iron mines. Traversella (Turin). Val Chiusella, Graian Alps. This ore is smelted at Pont-Saint-Martin, in the Val d'Aosta, and from it is obtained the celebrated iron of that valley, which sells at very high prices, on account of its excellent quality, being all made with charcoal. It is remarkable to see the identity of the iron ore in some of the serpentine rocks of Italy with that of Sweden. The product, also, is of the same nature; both are excellent.

3833. Granular magnetite, associated with milk-white calcite and greenish mica. From the iron lode, Traversella iron mine, Traversella (Turin). Val Chiusella, Graian Alps.

3834. Brown spathose iron (siderite), associated with a little pyrites. From the lode of magnetic iron, Traversella iron mines, Traversella (Turin). Val Chiusella, Graian Alps.

3835. Pyrites, associated with magnetite. Traversella iron mines, Traversella (Turin). Val Chiusella, Graian Alps.

3836. Gangue of the iron lodes, consisting of dolomite passing into siderite, quartz in limpid crystals of short pyramidal nature, with pyramidal terminations and a little granular magnetite. Traversella iron mines, Traversella (Turin). Val Chiusella, Graian Alps.

3837. Compact white quartz, from the magnetic iron lodes. Traversella iron mines, Traversella (Turin). Val Chiusella, Graian Alps.

3838. Crystalline pyrites, forming the gangue of part of the lodes of magnetic iron. Traversella iron mines, Traversella (Turin). Val Chiusella, Graian Alps.

3839. Calcite of lamellar structure and impregnations of magnetite and chalcopyrite, associated with traces of serpentine, without diallage. Traversella iron mines, Traversella (Turin). Val Chiusella, Graian Alps.

3840. Milk-white, crystalline, spathose dolomite, associated with a little granulated magnetite, pyrites, chalcopyrites and pirrotine. Traversella iron mines, Traversella (Turin). Val Chiusella, Graian Alps.

3841. Cryscocolla, from the outcrop of the iron lodes. Traversella iron mines, Traversella (Turin). Val Chiusella, Graian Alps.

3842. Magnetite, from a part of the lode which contains a very minute proportion of chalcopyrites, reduced to slick, ready to be separated by Sella's electro-separator. Traversella iron mines, Traversella (Turin). Val Chiusella, Graian Alps. The quantity of copper found in this part of the lode is so small that no other plan than the one used would be remunerative. The magnetite is afterwards sold and used in offices instead of blotting paper, and for other purposes, but is not smelted.

3843. Finely crystalline pyrites, showing a tendency to crystallize in octohedrons. Bore pyritee mine. Brosso (Turin). Val d'Aosta, Graian Alps. Typical specimen of the great pyrite lode, the produce of which is largely employed for the manufacture of sulphuric acid in Turin.

3844. Pyrites in octohedral crystals, from the great pyritee lode. Bore pyritee mine. Brosso (Turin). Val d'Aosta, Graian Alps.

3845. Pyrites, with oligist. Bore pyritee mine. Brosso (Turin). Val d'Aosta, Graian Alps.

3846. Micaceous, pulverulent, specular iron (oligist). Saore (Turin). Val d'Aosta, Pennine Alps.

Prepalæozoic Group—St. Alban's System.

3847. Somewhat lamellar, fine-grained, crystalline, pearl-gray marble. Saore (Turin). Val d'Aosta, Pennine Alps.

3848. Pearl-gray, crystalline marble of fine structure, showing the mica schist in contact with the beds of marble with which it is interstratified. Saore (Turin). Val d'Aosta, Pennine Alps.

3849 Bluish-gray, crystalline marble. Pont Canaveee (Turin). Val Soana, Graian Alps.

3850. Saccharoid white marble of large crystalline structure. The beds of marble are interstratified with the other prepalæozoic metamorphic rocks, and the general direction is very apparent. Pont Canavese (Turin). Val Soana, Graian Alps. An excellent ornamental stone, but of more lamellar structure than any of the Carrara marbles.

(To BE CONTINUED.)

HORSES DOWN A SHAFT.—The *Inter-Mountain* (Butte, Montana) tells this: About noon to-day, had anyone cast his eye on the hill west of the Original Butte hoisting works, his blood would have curdled at the sight presented. Coming over the brow of the hill at a break-neck pace was the team of Tadder & Walker, pulling a load of wood upon which were seated two men, one of them endeavoring to bring the frightened animals to a halt, a result he was powerless to effect. When about half way down the hill, and while traveling at a fearful rate of speed, the horses suddenly left the road and ran in a bee line for a prospect hole 16 ft. deep which they did not see in time to avoid. Both horses went headlong down the hole, the driver followed suit, and the wagon would have fallen in had there been room enough. The driver was painfully bruised and he is now suffering considerably, but is not believed to be permanently injured. His escape from instant death is miraculous. The horses were not killed, but when extricated one of them was found to be severely cut about the flanks and was bleeding like a stuck pig. The wagon did not suffer serious injury. The injured man is receiving the necessary medical attention. His companion escaped unhurt.

DOG TRAIN.—The Wood River *Times*, of April 5th, says: "There is between five and six feet of snow in the Sawtooth range, on a level, and three to six weeks must elapse before it can be crossed by wagons. The only means of communication at present is on snow-shoes or by dog train. Mr. Smith, one of Dow's stage drivers, rigged up one of these a week ago. He left Ketchum Sunday night, with another man, six dogs and 500 lbs. of bacon and sugar on a toboggan, and made nine miles before the crust softened so that he was compelled to stop. The dogs were untrained, however, and will do much better as they become used to travel. They are fed on oatmeal mush."

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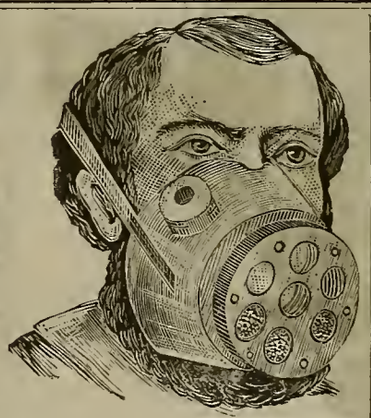

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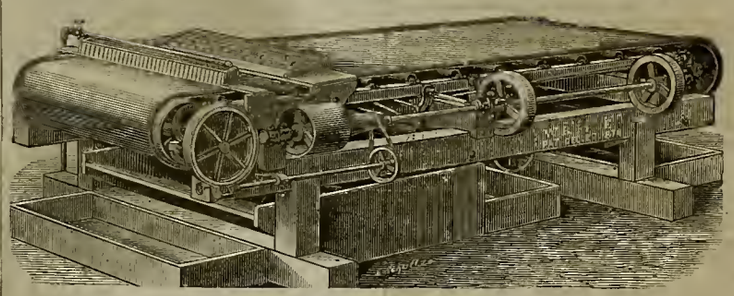

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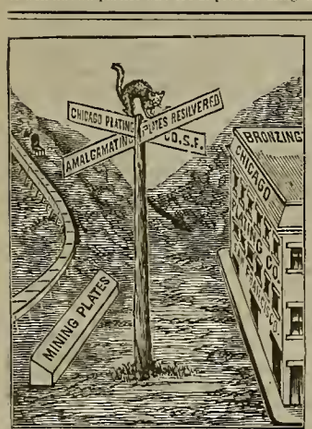

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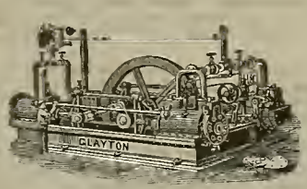

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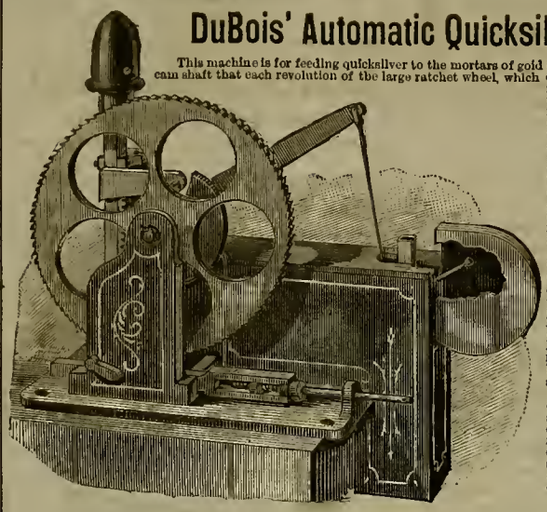

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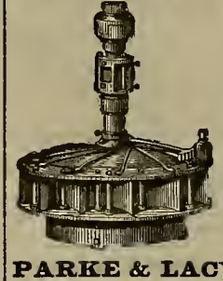

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HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

Business Directory.

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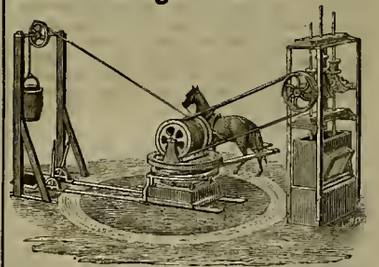
MINING ENGINEER,
Room 75, 115 Broadway, New York.
☞Agent for PADDOCK'S Ore Dressing Machinery. Mining Machinery supplied.

San Francisco Cordage Factory.
Established 1856.
Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
Extra sizes and lengths made to order on short notice
TUBBS & CO.,
611 and 613 Front Street, San Francisco

New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
C. H. BAKER,
Agent and Manufacturer of Mining Machinery
38 and 40 Main St., S. F.

WM. H. BELLOWS,
CONSTRUCTOR OF
Flumes and Ditches for Lumbering, Mining, Irrigation, or other purposes.
Routes Surveyed, Estimates furnished, etc, etc.
OFFICE—430 California St., San Francisco

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Chemist and Assayer,
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FINE WOOD PHOTO-ENGRAVING
SEND COPY FOR ESTIMATE. IT WILL PAY YOU. CROSSCUP & WEST. 702 CHESTNUT ST. PHILADA. PA.

AIR COMPRESSORS
SEND FOR NEW CATALOGUE & PRICE LIST.
CLAYTON STEAM PUMP WORKS
14 & 16 WATER ST., BROOKLYN, N. Y.
GEO. R FOARD, Agent, 18 First St., S. F.

WIND MILL. One of the best made in this State for sale cheap on easy terms. Address, W. T., care of Dewey & Co., S. F.

This paper is printed with Ink furnished by Chas. Ensu Johnson & Co., 509 South 10th St., Philadelphia, and 59 Gold St., N. Y. Agent for Pacific Coast—Joseph H. Dorsty, 527 Commercial St., S. F.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, No. 252 Market St., S. F.

FOR THE WEEK ENDING APRIL 11, 1882.

256 271—TRACE LOCK—Jas. A. Bassett, Windsor, Cal.
256 424—ADVERTISING DEVICE FOR STREET CARS—R. F. Bridewell, S. F.
256 283—AMALGAMATOR—Wm. T. Browne, Stockton, Cal.
256 284—VEHICLE SPRING—Geo. S. Buckland, Tulare, Cal.
256,180—ADJUSTABLE STOVE GRATE—De Goerre & De Lacn, S. F.
256,202—CAR COUPLING—Butte City, Montana.
256 304—HYDRO CARBON BURNER—Evan A. Edwards, Los Angeles, Cal.
256,354—SAFETY ATTACHMENT FOR ELEVATORS—Chas. B. Morgan, Oakland, Cal.
256 366—AIR SHIP—Carl W. Peterson, S. F.
Reissue 10 086—KITCHEN IMPLEMENT—John W. Ross, Santa Clara, Cal.
256 178—ROTARY ENGINE—A. W. Von Schmidt, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

VEHICLE SPRINGS.—George G. Buckland, Tulare, Tulare county. This invention relates to a new and useful spring and shackle for vehicles; and it consists in forming one end of the spring into a proper journal or bearing, wherein the shackle which is bolted or secured to the body or frame, may have a certain play to accommodate the rigid frame or body to the movement of the spring.

HYDROCARBON BURNER.—Evan A. Edwards, Los Angeles. No. 256,304. Dated April 11, 1882. This liquid hydrocarbon burner consists of a box or casing having within it a vertical longitudinal partition or diaphragm extending from the base to within a short distance of the top, dividing the box into two compartments, opening into each other over the top of the diaphragm, said compartments having separate entrances and a common exit or exits through a pipe or pipes leading from the upper part of the compartments and opening out under the casing or box. This burner is specially adapted for use in kitchen stoves or ranges. The heat from the device will carry on all necessary cooking.

TRACE LOCK.—J. A. Bassett, Windsor, Sonoma Co. No. 256,271. Dated April 11, 1882. This invention is an applisnce which the inventor terms a "trace lock," and which is intended to secure the loose end of a trace or tug of harness after the trace has been passed through the buckle. The lock takes the place of loops through which the loose end is usually tucked, and is adjustable, so as to be adapted to wide or narrow traces.

News in Brief.

SALOONS are hereafter to be closed by law in Ohio on Sunday.

PHILADELPHIA workingmen are indignant over the veto of the Chinese bill.

THE St. Louis Grand Jury recommends that saloons be limited to one in each block.

WAR is openly declared at Cairo against all Europeans engaged in official functions in Egypt.

FIVE thousand iron workers have struck in France against a proposed reduction in wages.

THE Methodist ministers of Philadelphia last week declared in favor of an Ecumenical Conference of the Methodists of America, two years hence.

FOUR excursion parties from the East, numbering in all probably 600 persons, are to arrive in Los Angeles soon, the first installment being due April 27th, and the remainder coming at intervals of a week.

THE new comet, according to the astronomers, will reach the perihelion passage on the 10th of June, and will be visible until September. The best observations will be granted to the people of the Southern hemisphere.

THE hearing in the matter of the contest of the will of Hon. Geo. F. Baker, deceased, took place before a jury in the Superior Court at San Jose. The jury were out 20 minutes, and returned a verdict that "at the time of making the will, March 8, 1880, decessed was incompetent."

AMALGAMATING PLATES.—Mr. W. E Shepman, whose advertisement appears elsewhere, informs us that he is filling many orders for silver-plated amalgamating plates, which he makes a specialty of manufacturing. He has been in business here 14 years, and having retained customers all that time, proves that his work gives satisfaction. Mr. Shepman plated the large steel hammer used for driving the "last spike" on the C. P. R. R., now on exhibition in the museum of the Pioneer Society.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired), be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F. D., at this office.

Cylinder Printing Press for Sale.

A large cylinder Hoe printing press, for country newspaper work, can be bought cheap by addressing
Press, Box 2361, S. F.

Laurel Glen Fruit Farm.

This place is beautifully located among the hills. A pleasant drive from railroad and beach. Deer and other game abound in the vicinity. A limited number of boarders can be accommodated for the summer and hunting season. The place is especially desirable for ladies with children. Address, for further information, Isaac Dakin, Soquel, Santa Cruz county.

Canvassing Agents.

We want several canvassing agents who will make it their business to solicit subscriptions and advertising for our first class progressive newspapers. Men of ability and experience can secure good pay and permanent employment. Send references and state your past occupation, etc., to the publishers of this paper.

Business Offices and Sunny Rooms to Let.

We have some desirable rooms to let adjoining the offices of this paper which will be rented on favorable terms. Stair entrance, No. 252 Market St. Elevator, No. 12 Front St. Parties wishing offices, etc., will do well to call and see them. DEWEY & CO.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

HOW TO STOP THIS PAPER.—It is not a difficult task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry O. Hanks, State Mineralogist.

A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

ANNUAL STATISTICIAN OF 1882.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 502 Taylor st. Price, $4.

Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Bullion Mining Company.—Location of Principal place of business, San Francisco, California. Location of works, Gold Hill Mining District, Storey county, Nevada.
Notice is hereby given that at a meeting of the Board of Directors, held on the 29th day of March, 1882, an assessment (No. 23) of Thirty (30c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 3, Safe Deposit Building, 328 Montgomery street, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the second (2d) day of May, 1882, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the twenty-fourth (24 th) day of May, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.
J. M. BRAZELL, Secretary.
Office—Room 3, Safe Deposit Building, No. 328 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE EUREKA CONSOLIDATED MINING COMPANY, Nevada Block, Room 37, San Francisco, April 15, 1882.—At a meeting of the Board of Directors of the above-named Company, held this day, a dividend, (No. 72), of Fifty Cents per share, was declared, payable on the 27th of April, 1882. Transfer books closed until the 28th inst. W. W. TRAYLOR, Secretary.

DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill and Mining Company,

San Francisco, April 10, 1882.

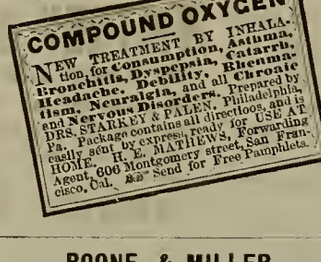
At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 62 of Fifty cents (50c) per share, was declared payable on Saturday, April 15, 1882. Transfer books closed on Tuesday, April 11, 1882, at 3 o'clock P. M.
WM. WILLIS, Sec'y.
Office—Room No. 29, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

REMOVAL.

H. H. NOBLE & CO.,
STOCK BROKERS,
HAVE REMOVED TO
311 MONTGOMERY ST.,
NEVADA BLOCK.

SIEGLER SPRINGS HOTEL,
LAKE COUNTY, CALIFORNIA.
JOHN SPAULDING, - - - - Proprietor.

GOOD HUNTING AND FISHING
Right at hand for the accommodation of Invalids. Baths of any desired temperature.
The SIEGLER SPRINGS STAGE will connect with the stage from CALISTOGA at LOWER LAKE on MONDAY, WEDNESDAY and FRIDAY; at GLENBROOK on TUESDAY, THURSDAY and SATURDAY. Time from San Francisco, TWELVE HOURS. These Springs have no equal in the State for speedily and permanently curing Rheumatism, Gout, Stiff Joints, Dropsy, Scrofula, Skin Diseases, Gravel, Diabetes, Female Diseases, Dyspepsia, Catarrh, Chronic Dysentery, Chills and Fever, Lead Poisoning, Paint or Colic, Constipation of the Bowels, and all diseases of the Stomach and Liver. Bright's Disease of the Kidneys and impurities of the Blood. The Hotel will be kept open summer and winter, the waters proving equally efficacious the year round. Important improvements have lately been added, including new
Bath House and a Fine Swimming Bath.
Address all communications to "SIEGLER SPRINGS," Lake county, Cal. W. T. GARRATT, Manager.


COMPOUND OXYGEN
NEW TREATMENT BY INHALATION, for Consumption, Asthma, Bronchitis, Dyspepsia, Catarrh, Headache, Debility, Rheumatism, Neuralgia, and all Chronic and Nervous Disorders. Prepared by DRS. STARKEY & PALEN, Philadelphia, Pa. Package contains all directions, and is easily sent by express, ready for USE AT HOME. Sent by H. E. MATTHEWS, Forwarding Agent, 600 Montgomery street, San Francisco, Cal. Send for Free Pamphlets.

BOONE & MILLER,
Attorneys & Counsellors-at-Law,
Rooms 7, 8 and 9
No. 320 California Street, S. F.,
(Over Wells Fargo & Co.'s Bank)
Special Attention Paid to Patent Law.
N. B.—Mr. J. L. Boone, of the above firm, has been connected with the patent business for over 15 years, and devotes himself almost exclusively to patent litigation and kindred branches.

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1850. 1882
RANKIN, BRAYTON & CO.,
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BUILDERS OF
MINING MACHINERY.

Plants for Gold and Silver Mills, embracing the latest and most improved machinery and processes for base and free ores. Water Jacket Smelting Furnaces for silver, lead and copper ores, with new and important improvements, superior to any other make. Hoisting Works, Pumping Machinery, Chlorid zing Furnaces, etc. We offer our customers the best results of thirty years' experience in this special line of work, and are prepared to furnish the most approved character of Mining and Reduction Machinery, superior in design and construction to that of any other make, at the lowest possible prices. We also contract to deliver, in complete running order Mills, Furnaces, Hoisting Works, etc., in any of the Mining States and Territories. Estimates given on application. Send for illustrated circular.

Dewey & Co.'s Patent Agency and Newspaper Offices.
Dewey & Co.'s Patent Agency and the business offices of the Mining and Scientific Press, Pacific Rural Press, Pacific States Watchman and the Fraternal Record are now favorably situated at No. 252 Market Street. Elevator entrance, *No. 12 Front St., S. F.*

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RUBBER HOSE,
BELTING and PACKING. CRACK PROOF BOOTS.
GOODYEAR RUBBER CO.,
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WORKS ORE WET OR DRY.

Manufactured at
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PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

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—FOR—
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The PACIFIC WATER JACKET SMELTERS embrace many features that are entirely new and of great practical utility, which are covered by letters patent.
No other furnaces can compare with these for durability and in capacity for uninterrupted work.
MORE THAN SIXTY of them are now running on the Pacific Coast, giving results never before obtained as regards continuous running, economy of fuel, grade and quality of bullion produced. We are prepared to demonstrate by facts the claims here made.
These Smelters are shipped in a complete state, requiring no brick or stone work, except that for the crucible, thus saving great expense and loss of time in construction.
Complete smelting plants made to order of any capacity and with all the improvements that experience has suggested as valuable in this class of machinery. Skilled and experienced smelters furnished when desired to examine mines and to superintend construction and running of furnaces. Estimates given upon application.
Send for circular.
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A physician who has long resided in the mines and other parts of California, and gathered a large and valuable collection of minerals and other specimens, offers the same for sale at a bargain. Address "Cabinet," box 2301, San Francisco.

The Explorers' Miners' and Metallurgists' Companion.
Comprising a Practical Exposition of the Various Departments of Exploration, Mining, Engineering, Assaying, and Metallurgy,
Containing 672 Pages and 83 Engravings,
BY J. S. PHILLIPS, M. E.,
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Issue TELEGRAPHIC TRANSFERS and SIGHT DRAFTS, available in all the principal cities and towns in

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The forwarding of MINING MACHINERY MATERIAL and SUPPLIES a Specialty!

GIANT POWDER

MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS.

Nos. ONE, TWO and THREE.

Stronger, Better and Safer than any other High Explosive

Judson Powder

IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞ Triple Force Caps and all Grades of Fuse.

BANDMANN, NIELSEN & CO.,

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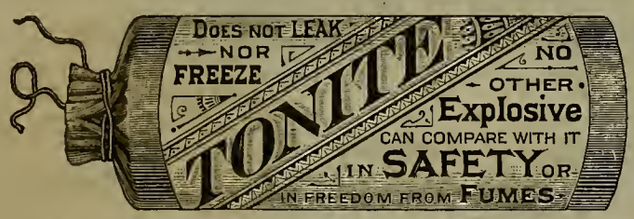
Contains no Nitro-Glycerine or Chlorate of Potash, and is the only High Explosive Manufactured in America that does not contain these Dangerous Ingredients.



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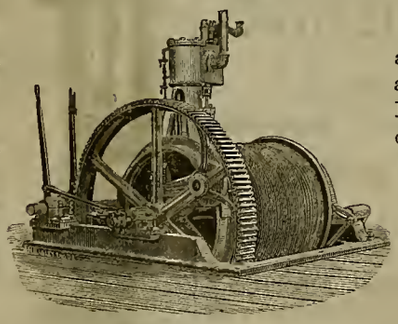
MANUFACTURERS OF ALL KINDS OF Mill and Mining Machinery. Engines, Boilers, Cornish Pumps, Ore Stamps, Crushers, Rolls, Stamp Mills, Smelters, Furnaces, Ore Cars, Kibbles, Etc. Also, Saw Mills, Heavy Forgings, Bridges and other Bolts.



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THE OLDEST AND LARGEST MANUFACTORY OF MACHINERY IN THE WORLD.

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Works, 33d and Wynkoop Sts. P. O. Box 1921.

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MANUFACTURERS OF

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SILVER PLATED AMALGAMATING PLATES.

These Plates are used in Quartz, Gravel and Placer Mining with gratifying success. I am constantly filling orders for them, and when once used they prove themselves so superior to any other process yet discovered for saving Gold that my customers would not do without them. I have the best facilities on this coast for filling orders for these plates, and will guarantee my work.

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W. E. SHEPMAN, Proprietor.

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NO ACCIDENT HAS EVER HAPPENED.

ALL POWDERS manufactured by the California Vigorit Powder Co. are SUBMITTED during the course of manufacture TO SCIENTIFIC and accurate TESTS for safety and strength.

They are tested for Safety against Friction, Fire, a Temperature of 212° Fahr., and the various shocks to which Powder is liable in practical handling.

The following qualities are common to all grades of Powder manufactured by the Company:

Safety, Non-Leakage; Freedom from Noxious Gases; Uniformity and Strength.

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DETONITE.

This is an explosive involving new principles and recently patented. It is the **Strongest Powder ever placed on the Market,** in this country or abroad. It is the **Safest Strong Powder ever made.** For very refractory rock this Powder is the most economical in the market.

VIGORIT. No. 1, XX.

This Powder is **Stronger than the Highest Grades of Hercules or Giant.** It is only surpassed by "Detonite." It is suitable for hard rock.

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For general work this Powder has no superior. It has the advantage over Giant, Hercules or Vulcan in safety and freedom from noxious fumes.

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Equal to any corresponding Grade in the Market.

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VIGORIT, L. P.

This is a Powder suitable for **Bank Blasting, Log Splitting** or the work generally in which Black Powder can be used. It is STRONGER THAN BLACK POWDER, having from twice to ten times the effective strength, depending on resistance. It is **Superior to Judson Powder,** in being more sensitive to the cap and more convenient in handling.

Best Qualities of FUSE and CAPS sold at Lowest Rates.

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The Best Low Grade Explosive in the market. Superior to Black or Judson Powder.

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The best Nitro-Glycerine Powders manufactured. Having secured large lots of the best imported Glycerine at low prices, we are prepared to offer the mining public the very strongest, most uniform and best Nitro-Glycerine Powder at the very Lowest Rates.

SPECIAL INDUCEMENTS IN PRICES.

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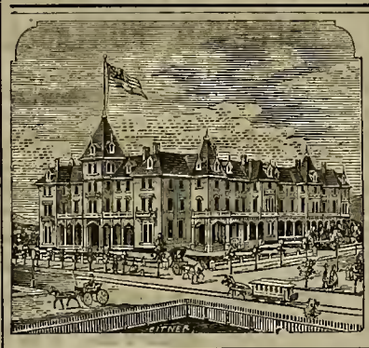

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SHELDON I. KELLOGG, Jr., Prop'r

"EUREKA" COTTON GARDEN HOSE.

MILDEW-PROOF AND RUBBER-LINED.

Will positively Not Break in the Kinks, Split Open, or Burst. Very Light, Easily handled, does not deteriorate with age, and is extremely durable.

Also, Cotton and Linen Fire Hose. Call and examine it.

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MANUFACTURERS OF
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Kinds of Machinery for Mining Purposes.
Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.
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Golden State & Miners Iron Works,
Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.
STEVENSON'S PATENT
Mold-Board AMALGAMATORS,
Golden State Pressure Blowers.
First St., between Howard & Folsom, S. F.

California Brass Foundry,
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SAN FRANCISCO, CAL.
All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. PRICES MODERATE.
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General Mechanical Engineer and Machinist. Steam Engines, Flour, Quartz and Mining Machinery. Sole manufacturer of Brodie's Patent Rock Crushers and Steel-Faced Tappits. Agent and Manufacturer of F. A. Youse's Patent Steam Packing Rings for Steam Pistons. The best ever invented; can be applied to any Engine Piston and give entire satisfaction to those using. Steam, Hydraulic and Sidewalk Elevators. Repairing promptly attended to.

STEAM ENGINES AND BOILERS
Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by
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THOMPSON BROTHERS,
EUREKA FOUNDRY,
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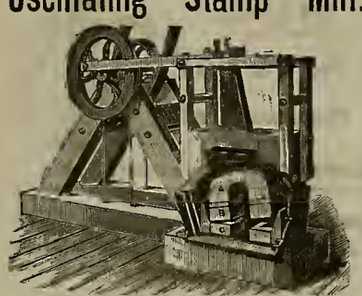
MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

HUNTINGTON'S
Oscillating Stamp Mill.

It has no Stems, Cams, or Tappets, and adjusts itself to the wear of the Shoes and Dies.
For simplicity, economy, durability and effective working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power. Awarded First Premium and Medal at Mechanics' Fair, S. F., 1880.
Manufactured by
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Improved Patent Grinding and Amalgamating Pans, Concentrators and Gold Amalgamators; also, Steam Engines and Mining Machinery of all kinds. Send for circulars.
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Practical, Civil, Mechanical and Mining Engineering,
SURVEYING, DRAWING AND ASSAYING,
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A. VAN DER NAILLEN, Principal.
Send for Circular.

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Reports, Surveys and Plans of Mines made.

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This COKE is exclusively used by Prof. Thomas Price, in his assay office, by the Selby Smelting and Lead Co., Prescott, Scott & Co, Risdon Iron and Locomotive Works and others in this city. Large supplies are regularly forwarded to consumers in Salt Lake and Nevada, to the Copper Queen Mining Co., Longfellow Copper Mining Co. and other consumers in Arizona.
The undersigned are in receipt of regular supplies from Cardiff, Wales, and offer the COKE for sale in quantities to suit purchasers.
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For both Galena and Copper Ores of the Most Improved Construction.
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SAVE YOUR GOLD!
—BY USING—
SILVER PLATED AMALGAMATING PLATES.
The most economical and successful process now in use. Will warrant my Plates to save more gold than any other method, and double the amount of the same surface of ordinary copper plates. The only plates that have proved durable and satisfactory.
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1 to 8 Tons Capacity
IN 24 HOURS, ACCORDING TO SIZE.
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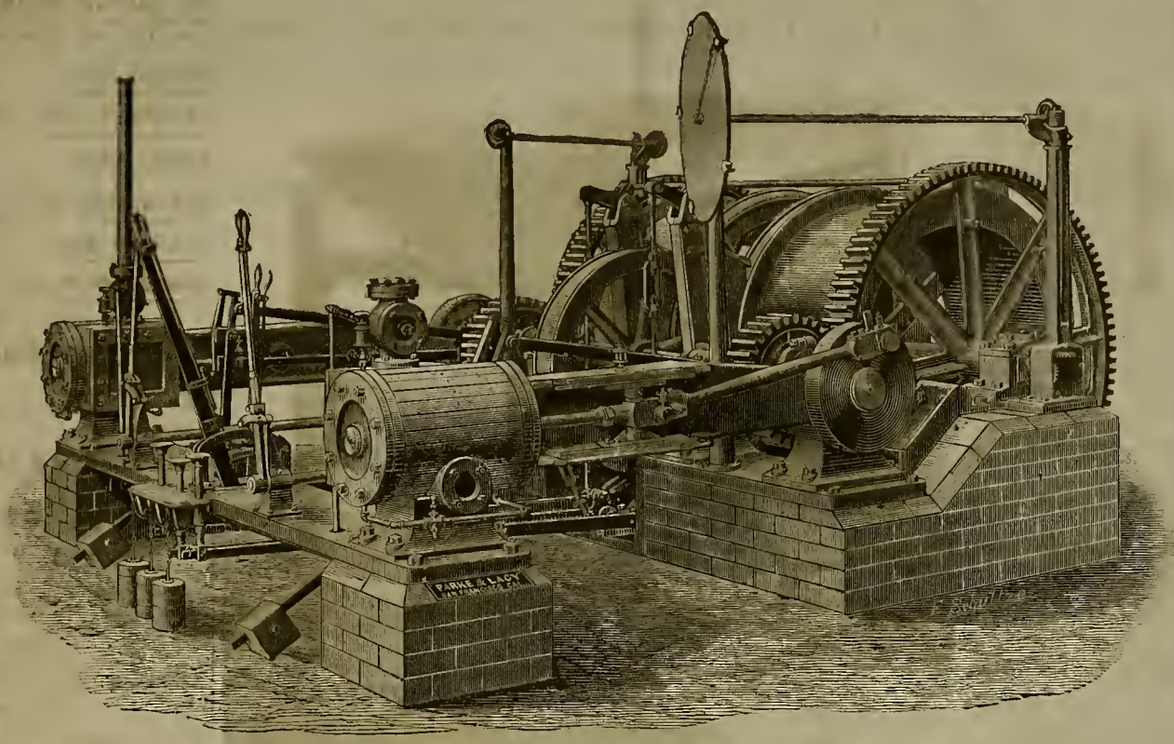

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The Korting's Injector is the simplest, cheapest and best in use. Will draft its own water, hot or cold, and feed under varying pressure. Send for Circular.

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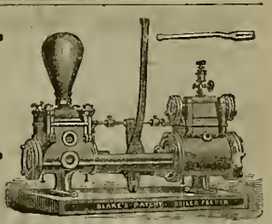

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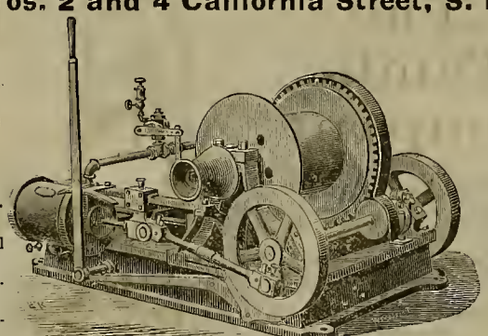

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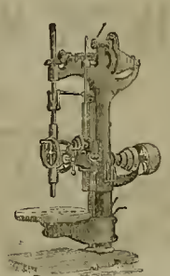

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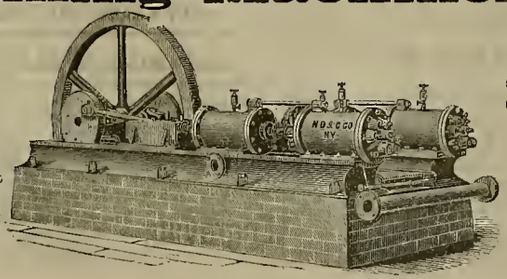

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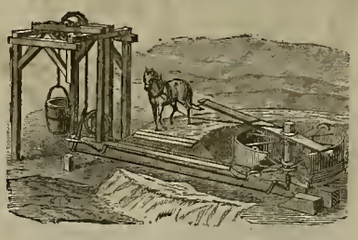
For Pile Driving.
MINING CARS,
Ore and Water
BUCKETS.



MINERS' HORSE-WHIM.

One Horse can easily heist over 1,000 pounds at a depth of 500 feet. The whim is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The standard of the whim is bolted to bed-timbers, thus avoiding all frame work. When required these whims are made in sections to pack on mules.

"THE $1,000 CHALLENGE"

Ore Feeder for Quartz Mills.

OVER 800 ARE NOW IN USE, GIVING ENTIRE SATISFACTION.

Awarded First Premium at the Tenth and Twelfth Industrial Fairs of the Mechanics' Institute.

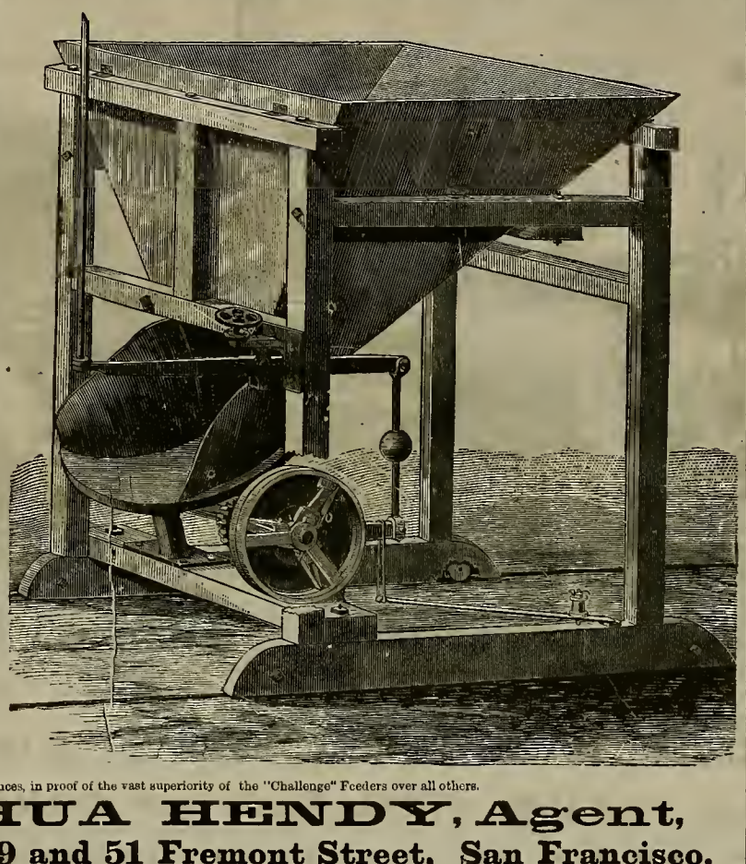
Twenty Per Cent. More Ore Crushed with Fifteen Per Cent. Less Wear of Iron than by Hand Feeding.

The accompanying cut illustrates the recently introduced Grip, and also the Spring Attachment, which replaces the Weight heretofore used, and which are obvious improvements.

It is now fully demonstrated, after careful and long continued experimentation and practical use, that the plan upon which a perfect Ore Feeder must be constructed is that of a carrier, and not that of a shaking table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Jerky or spasmodic contrivances will not answer the purpose for wet or sticky ores.

The Challenge Ore Feeders are now in Use in the following Mills, besides many others

Soulsby	20	Stamp	Tuolumne county, Cal.
Sheep Ranch	20	"	Calaveras	"	"
Mahoney	40	"	Amador	"	"
Zelle	40	"		"	"
Placerville	40	"	El Dorado	"	"
Gross	80	"		"	"
Julian	20	"	Placer	"	"
St. Patrick	15	"		"	"
Providence	20	"	Nevada	"	"
Omaha	10	"		"	"
Green Mountain	60	"	Plumas	"	"
Plumas Eureka	60	"		"	"
Bulwer-Standard	30	"	Bodie Dis., Mono,	"
Standard	20	"		"	"
Noonday	30	"		"	"
Bodie	10	"		"	"
Christy	5	"	Uintah Co., Utah.
Ontario	40	"	Parley's Park, "
Contention	20	"	Tombstone Dis, Arizona
Graud Central	20	"		"
Harshaw	20	"	Patagonia, "
Sunstone	20	"	Idaho Springs, Col.
Hn nestake	2 0	"	Black Hills, Dakota.
Fa her De Smet	8?	"		"	"
Hidden Treasure	40	"		"	"



Superiority of the "Challenge" Ore Feeder Demonstrated!

At the "Christy" Mill, Uintah County, Utah, the "Eclipse" Feeders, (conceived by E. Coleman) were introduced, but not carrying a regular supply of ore for the crushing capacity of the stamps, were replaced by the "Challenge," which are now running and the stamps crushing forty (40) per cent. more ore than was done by the "Eclipse."

The "Harshaw" or "Heimosa" Mill, of Patagonia District, Arizona, was also originally fitted with "Eclipse" Feeders, but after a few weeks trial they were pronounced inadequate to the work, discarded, and the "Challenge" adopted.

The "Silver King," Mill of Arizona, also removed the "Eclipse" Feeders to give place to the "Challenge."

The "Sola" Mill, of Brown's Valley, Yuba County, Cal., was fitted with "Victor" Feeders, manufactured by E. T. Steen, but proving insufficient, the "Challenge" Feeders were substituted.

Four of the "Victor" Feeders, manufactured by E. T. Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.

These cases are simply cited from among many similar instances, in proof of the vast superiority of the "Challenge" Feeders over all others.

JOSHUA HENDY, Agent,

Machine Works, 49 and 51 Fremont Street, San Francisco.

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Orders may be addressed to us at any of the following places at each of which we carry a stock.

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Limit of weight for 25-inch Lathes, 300 pounds. For 17-inch Lathes, 150 pounds.

Standard and Special Machine Tools.

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Room with steam power to let in the Pacific Power Co.'s new brick building, Steveneon street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

E. MAIN, 315 Folsom Street,

Makes to order Gents' Fine French Calf Boots from $6 to $10; Gaiters from $3 to $6; Alexis from $3.50 to $5; Mens' Heavy Kip Boots, $6; Oxford Ties, French Calf, $4; California Leather, $3.50; Men's Working Shoes from $2.50 to $3; Children's Shoes made to order. Persons in the country ordering to the amount of $12. I pay the express charges. I sell nothing but my own manufacture.

KNIGHT WATER WHEEL.

All sizes of this Superior Wheel furnished at the shortest notice. Send for circulars to

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VIA EL PASO, TEXAS,

Mines examined, reported on and superintended in any part of Mexico. Will buy or rent good mining property FOR SALE.—Several groups of good mines in State of Durango. 1,450,000 acres ranches.

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FOR SALE.—3 12x15 in double cylinder, second-hand BURLEIGH AIR COMPRESSORS, newly refitted with improved valves and adapted to run by belt together or separately—all as good as new. Can be bought to advantage.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, APRIL 29, 1882.

VOLUME XLIV Number 17

Marking Locations.

A carelees marking of the boundaries of a mining olaim when it ie taken up is liable to make endlese trouble for ownere, in caee the mine is rich and becomes well known. Then, when it is worth having, there are any number of people to try and eatablish claim to it.

A prospeotor ehould first try to find the vein, of course, and that heing found, shonld determine its general direction, hy which direction he will he governed in marking the houndariee of the claim on the enrface. Then when he records hie olaim he ehould give the couree and distance, ae nearly ae practicahle, from the diecovery ehaft on the claim to eome permanent, well-known pointe or objecte, euch, for inetance, ee etone monumente, hlazed trees, the confluence of etreams, pointe of intereection of well-known gulchee, ravines or roads, prominent huttes, hille, etc., which may he in the immediate vicinity, end which will eerve to perpetnate and fix the position of the claim and render it sueceptihle of identification from the deecriptiou given in the record of locatione of the dietrict.

In addition to the foregoing, the olaimant ehould state the namee of adjoining claime, or, if none adjoin, the relative positione of the neareet claime. He should drive a poet or erect a monumont of etone at eaoh corner of hie surface ground, aud at the point of diecovery or diecovery ehaft ehonld fix a poet, etake or hoard, upon which ehould he deeignated the name of the lode, name or names of locatore, numher of feet claimed, and in which direction from the point of diecovery.

It is very eeeential that the location notice filed for record ehall, in addition to the foregoing deecription, stete whether the entire claim of 1,500 ft. ie taken on one eide of the point of diecovery, or whether it ie partly on one eide and partly on the other side; and in the latter oase, how many feet are claimed upou each eide of the discovery point.

We have before noted theee pointe, hut deeire to impreee them on proepectore who are now heginning their eeaeon's work, hecause they are important for them to remember.

A recent ruling of the Commieeionere of the General Land Office makes manifest the importance of great care in making and deecrihing and marking mining claime in the notice of location for record. The Commieeioner rnles that an application for a mining claim eurvey muet he declined by the Mineral Deputy Surveyor where the location was not properly marked on the grouud and recorded; and when he makee such eurvey he must give in hie field notee thereof the hearinge and dietancee of hie cornere to thoee cited in the location notice, and the eame muet he ehown on the official plat of the eurvey to enahle the Department to determine the legal propriety of the eurvey.

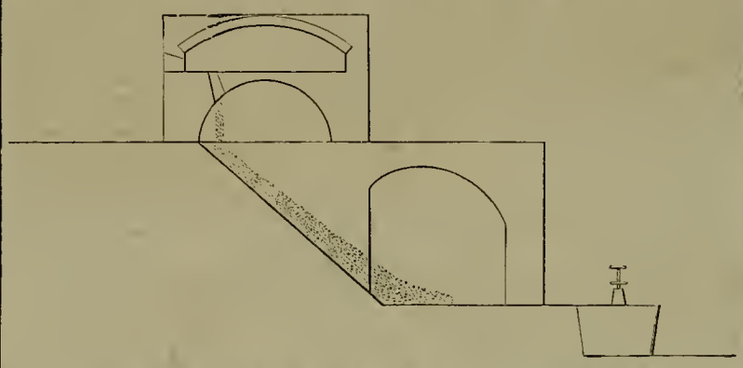
The ruling reenlte from that proviaion of the law of May 10, 1872, which requiree that "the location muet he distinctly marked upon the ground, eo that ite houndariee can he readily traced," and that euch deecription of the claim shall he given hy reference to eome natural ohject or permanent monument, ae will identify the claim. "The proviaione of the law mnst he strictly complied with in each caee to entitle the claimant to a survey and a patent." In all caeee if the location was properly made, it wae marked upon the ground. If the eurvey of it was properly executed it must have heen within the limite thue marked, and if the marke of the location and thoee of the eurvey are identical, the facts must appear etated in the official field notee.

Plans have heen drawn up for an electrical railway connecting the eastern and western ends of Berlin with each other. The road will he placed above the etreet on high columne, like the New York elevated roade, and statione will he erected at Lutzow equare, Magdehurg equare, Potedam etation and Donhof square. A curione point in the plane ie an arrangement for lowering the traine to the etreet level at etatione, thus allowing people to get out or in hefore the traine are raised again to the level of the track. Power eupplied hy electrioity will do the work of raieing and lowering the trains.

Ore Roasting Furnaces.

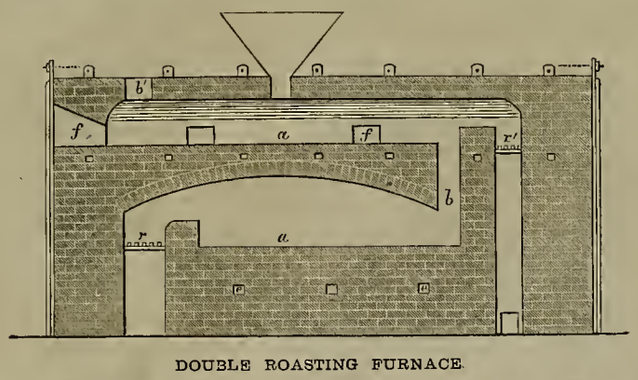
In huilding a roasting furnace, where the locality ie favorahle to euch an arrangement, it ie a great advantage to place the furnace eo that the floor on which the roaster etande ehould he 10 to 18 ft. higher then the cooling floor, wherefrom the ore cen he cerried to the amalgamating pans or to the leaching tuhe, ae repreeented hy the outline eketch on this page.

A douhle roasting furnace is repreeented in longitudinal croee eection in the lower one of the engravinge. It ie deecrihed in Kuetel's "Roaeting of Gold and Silver Oree" (for eale hy Dewey & Co.) as followe:



PLAN FOR ROASTING FURNACE AND COOLING FLOOR.

The lower hearth, *a*, ie 9 ft. long and 10 ft. wide. The roof in the center ie 28 inchee, and at the flue and hridge 14 inchee ahove the hearth. The fire-place, *r*, ie 20 inches wide, 8 ft. long, and 20 inchce from the roof. The flue, *b*, ascende to the upper hearth, *c'*; the working door, *o*, is on the hack eide. In case there should he required more heat than ie ohtainahle from the lower hearth, there is an auxiliary fire-place, *r'*. The flame goee throughthe flue, *b'*, into duet chambers. Theee chambere have croes partitione lengthways, hy which the draft ie forced to take a longer way hefore it entere the chimney. From the upper hearth the ore is drawn through the flue, *b*, to the lower hearth; *e'*, *e'*, are canals for the eecape of moisture, and *e' e'* for the tie-rode. The two hearths cen he ueed eeparately if needed. This fnrnace, although eomewhat inconvenient for the roastere, hae the advantage of taking up leee epace, and as the ore drope from the drying hearth on the eecond, and from there on the firet hearth, it effecte a good mixing of the not uniformly heated ore. The auxiliary fire is ueeful for eilver ores, whioh eeldom contain eo much eulphur as to hurn long enough without the help of a nearer fire than that from the lower hearth. In working ooncentrated eulphurete, the upper fire can he dispeneed with. Deetken, who has had long experience in roasting eulphurete, conciders thie kind of furnacee euperior to the long onee and to all othere he ever ueed. The arch in the middle ie only eight inchee thick, hut, heing made level, the thickneee increaeee towarde the eides. A few daye after etarting up, the whole roof ie sufficiently heated to keep the entire mase of the eulphurete red hot throughout, and the fuel ie hetter ntilized; one ton alwaye heing drawn from the upper hearth, when the preceding charge ie finiehed. The charge on the lower heerth requires, generally, from 8 to 10 houre hefore the roasting is completed. In conetructing a donhle furnace, in two etoriee, it is essential to uee a number of iron ties acroee the width of the furnace, hetween the lower and upper hearth; otherwiee, on account of the weight of the upper charged hearth, the side wall would invariahly give way in the conrse of a while. If used for the roasting of gold eulphurete, or such oree ae do not require the auxiliary fire, the working doore can he placed at *m* and *n*, and, at *m*, a hoe can he advantageouely ueed in drawing the charge to the lower hearth.



DOUBLE ROASTING FURNACE.

Depths of Shafts at Bodie.—It ie moet gratifying to obeerve that the hig ehafte are heing continued etraight down, and that new levels are to he opened at varioue pointe. During last week work wae reeumed at the Lent ehaft, helow the 800 level, and in a ehort time the 900 will he opened. The Standard ehaft ie now down 1,210 ft. The Red Cloud hae more water to contend with, and goee down eomewhat elower than the othere, hut hae attained the depth of 762 ft. The Tioga ehaft ie hut a few ft. ehort of 1,000 ft. deep. The Goodehaw ie 750 ft. and the Oro 714 ft. deep. Theee are certainly very reepectahle depths for an "ontside" camp; hut it wae at lower pointe than theee that the greateet ore hodiee on the Comstock were found—a district in many particulare very eimilar to Bodie. We feel aeeured that hetween the 600 and 1,500 levels of some of our minee ore hodiee will he developed far greater in dimeneione and value than thoee ahove that point—from which the not ineignificant eum of $13,000,000 hasheeu taken in 4 years.

Laying Dust in Mines.

It ie now pretty well eetahlished that coal duet in fiery coal minee ie an element of danger, and may, with an almostinappreciable quantity of free oarhureted hydrogen gae moving at a high velocity, explode at a Davy lamp. To render coal dust neutral in explosione, they muet not only prevent it from mixing with the free gae of the mine, hut they muet prevent it from mixing with the ventilating current. In all fiery seame they reqnire a etrong cnrrent to eweep out the geeee of the mine, and the deeper and more exteneive the coal winnings are carried, the more neceeeary it hecomee to increaee the velocity, more eepecially if the preeent eyetem of exhauetive ventilation continuee. And the more the velocity increasee, the more dusty, and conseqnently the more dangerous, doee mining hecome. To work and nee hlasting agents in euch a mine, ie, if anything, even more dangeroue than if the work and hlasting were cerried on in a huge gasometer filled with gae.

To find a reliehle meane of laying thie duet, nnmeroue experiments have heen made. Mr. R. Stevenson, a memher of the North Staffordehire Inetitute of mining engineere, described at a recent meeting the experimente he had made, and the method he had finally hit upon to remedy the evil. The hint given may he carried out in mines on this coaet wherever duet ie trouhlesome.

He had uuder hie charge some workinge, which, for eeveral reasons, could not he worked profitahly on the longwall eyetem, eo that the coal headinge had to he carried out to the extreme end hefore coal-getting could hegin, and the coal heing ehnt out hy faults from any higher workings where the gae might have escaped, and water fonnd its way into the coal to replace the exuded gas, the workinge were rather hot and dry, and the dnet wae eimply ahominahle. He tried eweeping and ehowering water along the roadwaye and headinge. It wae so difficult to get accuetomed to the conetant practice of ewallowing the duet that he reeolved to lay it. Water wae found to he of little avail unleee all the roadwaye were previouely ewept, and even then the heat and the velocity of the air-onrrent eeemed to make the water evaporate almoet as quickly ae it could he eprinkled over, unleee the floor wae drenched, when the fire-clay hegan to heave and give much tronhle. Having provided a few tons of soiled ealt, he tried it as a snhstitute for water, or at leaet ae an aheorher of moieture, thinking that a combination of the two might anewer. The uee of water had heen stopped a month when the ealt wae tried, and there wae a large accnmulation of coal duet in the mine. The salt wae ecattered on the top of the duet. The firet day it wae dieegreeahle to the trolly lade, and the colliere complained, hut eoon a different tale was told, and now the workpeople felt more ae if they were in a eanitarium by the eeaside than in a duety coal mine as it formerly wae. Heaps of duet, which with the least disturhance formerly roee in cloude and floated along the air current, would now lie as etill as damp sand. Salt, if used intelligently, in quantitiee of one ton per 500 yarde of six-ft. roadway once every week for the firet month, and once a month afterwards, would render the working in fiery eeame a pleasure and a profit, instead of heing what it now wae, an ahomination and a terror to every one interected.

The committee of the tradee aeeembly hae adopted a etamp or trade mark to he placed upon all goode manufaotured exclusively hy white lahor. Thie stamp is intended to he used hy all trades unione represented in the tradee aeeembly, and will he preeented to the forthcoming Anti-Chineee convention for indoreement and further action, ae it is intendod for general use throughout the Pacific coast.

The veto meesage of Preeident Arthur has heen translated into Chineee hy direction of the six companiee, for oirculation among Mongoliane of the npper cruet. The meesage occupies eeven columns, each containing five columne of chineee charactere, which are lithograph fac-eimilee of the meesage as it appeared in the Chineee newepaper ahout two weeke after it wae seut to Congreee.

Prospecting as an Art.

The Work in General and in Idaho in Particular.

The work of Prof. Clarence King, entitled "Statistics of the Production of the Precious Metals in the Unitsd States," compiled in connection with the tenth census, came to our hands a few days ago; and after scanning its elaborate tables and illustrative plates, various questions snggsstad themselves, of interest to the entire civilized world. The first was: How much of gold and silver will Idaho contribute in the futnre to supply the falling off of production in other quarters, notably in Nevada? Another presented itsslf in this form: Is not the time approaching when the national Government must do somethiug to sustain this industry, by rewards and bounties to those who devote their lives to the trying and perilous pursuit of hunting for and developing lods mines? The latter question will at some day, not very distant, claim attention from the publicist and statesman. The two questions hring to mind the subject of the ways hy which the desp mines, or quartz rock in place, are primarily taken; that is, discovered, msde known and opened up.

Since the search for the precious metals commenced on the coast of the Pacific, now a full generation past, mnltitudes of sturdy workers have hesn opening the hard leaves in the surfas of the earth, and the eye of the scientist has followed their labors, in the attempt to decipher some general laws or principles which nature may have pursued in the formation of ledges and the deposition of her mineral treasures. Mining has been sufficiently successful and profitable to stimulate the mightiest endeavors of American genius, and has given birth to mechanical devices for penstrating to great depths, and raising the solids and liquids thsrefrom, far beyond anythiug ever before contrivsd hy the skill of man. It is equally a fact that the processes for redncing ores have, during the same period, been carried forward to a snrprising excellence. But while the business has marched from one improvement to another, in the perfecting of machinery for working mines, and in ascertaining hetter methods for extracting ths metals from ores, all attsmpts to formulate rules or to deduce general laws to direct the prospector in his explorations have proved almost wholly valueless.

The experience of every man wbo has been concerned in this pnrsuit has furnished him with some ideas, snch as, thet gold and silver have an affinity for porphyry and granite, and that the hase metals, such as lead, have a partiality for limestone and shale. Even when adopting these general facts for what they are worth, he is compelled to let in such liberal qualifications that, at last, he is compelled to say that there is no maxim allowable as to the strain of rock formation in which the precious or hase metals are to be found, or from which they are excludcd. Silver quartz he knows to he impartially distributed in porphyry and lime, and that argentiferons lead may spring from almost any "country rock." Of one thing he can be quite certain, and that is that the precious metals are not cosmopolitan, hnt are confined and local to certain districts of the world; and that these metal-bsaring regions are marked hy featnres, in respect to the characteristics of which the ordinary practical geologist and observer of strata can rarely he mistaken.

There is one feature incident to the composition of the surface of Idaho which the prospector encounters more commonly than when doing his work elsewhere. It is not pretended that it is nnique to this country, hut it is surmissd that the work of ledge hnnting will begin here about where it has left off in other sections. The results will be instructive, if we mistake not; and, having mastered the lesson of unearthing hlind lodes here, he will he prepared to go hack to follow with greather success his exploratione in the older fields in which he has been gleaning. While elsewhere ledges have been sought out through an outcrop or reefing upon the snrface, in a great part of this Territory the pick must be more vigilantly employed. It will he fonnd that the presence of mineral deposits in any given locality is often only indicated by "float," and that the search for the ledge above gronnd is attended with ill success. In many cases where rich rock has heen discovered mingled with great masses of what is known as "slide," it has required a persistent toil and struggle with the gravitating debris to detect the source from which his specimen had become originally detached. In other cases a more tenacious covering of soil has had to be removed hefore the apex of the lode could be discerned and fixed. The serions difficulty, of course, where ledges are so capped over, is to find out where to apply the hands judiciously and most economically. The practiced eye and good judgment of the searcher comes into play in every such difficulty, and he needs to snmmons the aid of his hest faculties to make his work effective. His patience and strength must he widely wasted where he is incapahle of getting at right directions from very meager signs. To those familiar with the facts connected with the discovery of many valuable mines, it has become a matter of remark with what precision some men will follow the slightest indication and unearth the buried vein. The sleuth-hound is hardly more true to the scent of his prey than is the genins of some men on the track of a hidden bonanza. With them it appears something akin to an intuition to retrace the run of a fragment of vagrant rock hack to the spot of its origin. It is not, however, so much an indefinahle sense that guides, as it is the discipline of the reasoning faculty hy long and diligent exercise in this single direction. So that prospecting really may bs ranked as an art, skill or distinction in which is attained hy practice and experience, under vicissitudes, perils and privations to which the votaries of no other art are subjected. The labors of this host of independent adventurers have dons a great work for the advancement of the activities of the age; they have brought into being that wealth which has given new wings to commerce, which has been the fonndation to the credit of the Republic in a time of inestimable trial and danger, and supplied a constant motive power to tbe world, which cannot bs diminished without serions dstriment to our own country as well as to all civilized nations. We owe to this class, who founded in the mountains of California, a third of a century ago, the charter of this unorganizsd guild, whose membership has spread from the Pacific to Colorado, and from Alaska to Mexico, a debt of obligation, not less than that dne to tbe bravest of its soldiary.

In Idaho they enter the last field of unexplored domain belonging to the United States. When they shall have opened the rocks from the Snake river to the British line, there will he other fields for them. The vast realm over which they have been scouring in the past generation, will challenge their higher skill and larger expsriance; and they, and men of like tastes and attributes, will continue to explore and smite the rocks for streams of metallic wealth for immeasurable time to come. Were this not true, there would be an end of mining for the precions metals, and a period of exhaustion might be predicted.—*Wood River Times.*

The Reduction of Rebellious Ores.

In conversation with one of the best millmen in the State, this week, Mr. Thomas Mitchell, he observed that it was possihle to work hy mill process, no matter how rebellions, any ors that did not contain a sufficient percentage of lead to smelt. He has discovered a process of dsulphurating which, he claims, will save the precious metals, while freeing ores from the haser mstals. One of the greatest drawhacks to profitable mining in Eastern Nsvada has been the seeming impossihility of freeing the rebellious matter contained in the ores, and saving the gold and silver. Any process hy which this can he successfully accomplished will he hailed with delight by mine owners who are possessed of mines rich in these rebellious ores, from which assays can he obtained that go far up in the hundreds, bnt which prove, when the attempt is made to work them hy any mill eystem at present in use, disastrous failures, and smelting is out of the question, as they do not carry e snfficient percentage of lead. The ores that we refer to particularly ere those that carry a considerable percentage of gold, with silver and the haser metals, and these have never been successfully treated in eastern Nevada by the mill process. Mr. Mitchell acted as Foreman of the Alexander mill for a number of years, and was always very successful in his treatment of the base ores of this district. It is his intention to patsnt this new process, which he feels certain will render the working of rebellious ores, that do not contain a sufficient percentage of lead to smelt, profitable to mine owners.—*Grantsville Bonanza.*

The Spot where Gold was First Discovereo.—Dr. Holmes, the well-known dentist, has just returned from a two weeks' visit to Coloma, California, his old-time mining camp. Coloma is the spot where gold was first discovered in California, bnt its glory as a place of mines has long since departed. It is now a place of orchards and vineyards. Although surrounded hy snowy mountains, snow seldom falls in Coloma. There grow the fig and the almond tree, and there flowers bloom every month in the year. The people live in vine-embowered cottages, till their gardens, train their vines, prune their trees and are happy, giving no thought to undergronnd wealth that lies deeper than a hill of potatoes. The only miners now seen about Coloma are Chinese. Under the orchards and gardens is still a considerable amount of ground that the pick has never disturhed. The Chinese occasionally get upon leads of gravel that rnn into these, and the high prices they are willing to pay for a small strip off a garden or orchard shows that they find the ground prodnctive. One man has year after year disposed of slices of his orchard, and only the other day sold for $800 the ground on which stood four apple trees.—*Virginia Enterprise.*

Good Yield.—Forty tons of quartz taken from the Wide West mine, on Canada hill, has just been crushed at Crosby's mill. The clean-up amounted to 169 ounces of amalgam, which when retorted gave a 76-ounce har of gold, worth about $16.50 per ounce. This gives a yield of over $30 a ton, not including the sulphurets. The entire yield of the crushing will probably reach, $1,400. The owners of the mine are highly pleased with the returns. Heavier hoisting works will soon he put up over the new incline now being snnk. When the works atart np, from seven to ten men will be employed.—*Nevada City Herald.*

Lead is selling in London for £14 7s 6d to £14 12s 6d per ton for English, and £14 7s 6d for Spanish.

The State Bag Factory.

Work was hegun last week at the new hag factory at the State prison, San Quentin. The warden, Mr. Ames, has secured 500 lbs. of jute seed from India which he will distribute to all who wish to try the growth of the plant. Ths present expectation is that California cannot only make the hags hut can grow the fiber, and anyone desiring to plant jute, to test it as a crop, can obtain the seed by application to Warden Ames, San Quentin.

A resident of Napa who lately visited the State prison gives the *Register* the following account of his observations:

The fiber used at the prison is imported direct from Calcntta. It is quite coarss, is six or eight ft. long, and is tied up in bundles, each of which weighs about 400 lbs. Bsfore it is ready to he woven into cloth it passes through ssveral complicated machines, which reduces it to the fineness and softness of silk, yet when spun into yarn, it presents that coarss appearance all are familiar with who are acqnainted with hurlaps. There are 100 looms in the factory, hesides spinning and other machines, all of superior qnality and of marvelous workmanship. Only a portion of the looms are at present used, 115 convicts, 4 skilled foremen and 24 freemsn heing employed in running them. As soon as practicable all the looms will be put in opsrstion, when ahont 400 men will be employed in the factory. There heing but few workmen in the State skilled in weaving jute cloth, several Chinamen, who formerly worked in the Oakland jute factory, are and will he employed until the convicts are instrncted in the workings of the machinery. As a matter of coarss the employment of thsse free Chinese has excited much opposition from various quarters, hut it is the intention of Warden Ames to keep them only so long as is necessary for the instruction of others, when convicts only will bs employed. Fifty thousand sacks per day will be manufactnred when the works shall he run to their full capacity. After the cloth is woven it passes over and under a series of large rollers—termed a calendar—which exerts a pressure of 600 lbs. to the sqnare inch, making the fabric more pliahls, at the same time stretching it at the rate of one yard in ten. Then after passing throngb a finishing machine, it is run through a cutter, where revolving knives rapidly clip the cloth into suitable lengths for bags. These will all he sewed by hand in the best manner.

The opposition encountering the establishment of this factory has heen principally hy parties interested in the Oakland jute factory. hut such jealousy is needless. It became evident to the authorities that when the system of contract labor should cease (Decemher 31, 1881), that a large number of prisoners would have little or nothing to do. Aftsr much consultation, it was dscided to inaugurate the manufacture of burlap sacks, as that industry would interfsre less with the indnstry of the free lahoring men throughout the State than any other. Present appearances indicate that the plan was a wise one. There is little fear that the State factory will injure the trade of the one in Oakland, for both together cannot hegin to supply the yearly demands, which amounts to abont 30,000,000 sacks. The annual production of the Oakland works is abont 3,000,000.

Matting Copper.—Mr. Bowers is doing good service to the mining interest of Utah, by introducing the matting process for copper ores, at the Mammoth mill, Tintic. One furnace is in operation; a second will he in a few days, and three more are to be erected at once. A furnace reducee 10 or 12 tons of ore per day, requiring about one cord per ton of cedar-wood fuel, costing $2 to $3 a cord. The matte so far made is 60% to 70% copper, and $225 to $250 per ton of matte, gold and silver. Of course this will vary with the qnality of ore. The ore sbould he graded as to copper, too, so as to get 10 tous inetead of five into one ton of matte. Then it would he proportionately richer in the precious metals, and the cost of transportation would he comparatively less. The early completion of the railroad from Lehi to the mill will enable them to get coal if they desire to for $5 or $6 a ton, from Pleasant Valley; also, to carry in iron pyrites to give the snlphur required in the operation, and which is not abundant in Tintic district. What the cost of this work is, it is too early to figure on. We have little donht that it will prove to be profitable, however, to reduce the Crisman, Mammoth, Copperopolis, and other Tintic ores, and indeed ell gold or silver, or gold and silver ores carrying as mnch as 5% copper, found in the Territory, hy this process. The works, or some works, shonld he located at the Utah Swansea (Sandy), so as to he central to, and in mail connectiou with, all the mining districts.—*Salt Lake Tribune.*

Five thousand employes in Paris, representing every trade connected with the manufacture of iron, bave struck against the proposal of the masters to dednct 40 centimes to every hundred francs wages, to he applied to the payment of an insurance premium for the men against accident.

American cars, locomotives and railway appliancea generally, continue to increase in popularity abroad. Every month and every year gives American products a better standing, and our manufacturera may look forward to the future without anxiety.

Close Call of a Miner.

The Eureka *Sentinel* of the 14th says: A man hy the name of William Bennetts was at work in the K. K. miuc, on the fifth level, at 11 o'clock yesterday forenoon. He is a tributsr, and was working in a raise. He was approaching an old cave. He did not know how far off he was, hut thought he was a considerable distance from it, when all at once, without any warning whatever, the roof of the cave cracked and a mass of old ground was precipitsted upon him. There was no chance for him to get out. His only means of escaps was to climh as the dirt was falling, which he did. The manner in which he strnggled to save his life is something remarkahle. Some of the debris which fell ehout him wes in the shape of large howlders, many of them weighing at least 400 lbs. His candle had been knocked out of his hand and extinguished. Luckily he was not struck by the masses of falling rock, and kept on climbing upon thsm as they fell and settled ahout him and above him. He fought in this way againsta seemingly inevitable death for a distance of 20 ft. upwards, perpendicularly, when the caving ceasod. Then he struck a match and waited where he was for ahout an hour, inclosed hetween the roofing that had fallsn off in an arched wall above him and the loose dirt helow. He was literally huried alive for this time; hut fortunately a little air came through the ruhbish crevices—sufficient to sustain life. By this time his partner, who was working at a short distance from him, went to look for him, and discovered the cave. He, John C. Harris, communicated at once with the foreman, Joe Bice who, with a crowd of men, repaired to the scene of ths accident, for the purpose of removing the dirt and exhuming the huried miner, and having barely a hope to dig him out alive. They were on the spot sounding and calling for some time, when they heard a faint and smotbered sound, as of a voice proceeding from a distance. They finally selected the point nearest him. He spoke to them and told them that he would throw himself across the "gunnis," and that they should let the dirt drop three or four ft., and he would give way and fall on it. This operation was repeated several times, until he finally emerged from his tomb and stood once more on the level among his fellow-workmen, somewhat scratched and hruised, but with no bones broken. The report had gone abroad that he was buried alive in the cave, and a large crowd had gathered ahout the K. K. shaft, expecting to see his dead body brought to the surface. The agony that his wife endured in the time of suspense, while snch news as could he had from the mine was brought to her by a kind friend from time to time, can hetter bs imagined than described. The joy that prevailed on the hill when he was restored to life and his distressed wife was nniversal and unbounded. Bennetts is a good, cool-headed miner, otherwise he could not have survived. His presence of mind and mastery of the difficnlt sitnation alone saved him.

Deeds of Gift instead of Wills.

Those who wish te he sure that their property will go, after their death, to the ones they desire, should not make wills which involve going through probate and many legal expeuses. They should make deeds of gift, which they must personally deliver to the wife or other person to whom they wish the property to pass. We have repeatedly called attention to this matter before, hut almost every week our attention is called to cases where the making of deeds of gift before death would have saved hundreds of dollars in money, and in some cases, almost untold annoyance and delay in probate. Were all lawyers good probate lawyers, widows and devisees would not he so much harassed; hut the widow entrnsts her probate business to the first lawyer mentioned to her, or to some one whom she happens to know; and as probate proceedings are at hest hut a complicated system of red tape, lawyers thoroughly familiar with every detail are scarce. Probate business has, therefore, to he repeated two or three times. Deeds of gift render all probating unnecessary, and involve an expense not to exceed four or five dollars. They place the devisee in immediate possession of the propsrty, too. The following is the legal form of a deed of gift:

Blank Form of a Deed of Gift.

[Blank Published.]

This Indenture, made the *thirty-first* day of *April*, in the year of our Lord, one thou-and eight hundred and *seventy-four*, between *James A. Clayton*, of the county of *Sierra*, State of California, the party of the first part, and *William Clayton, his son*, of said county, the party of the second part, witnesseth:

That the said party of the first part, for and in consideration of the love and affection which the said party of the first part has and bears unto the said party of the second part, as also for the better maintenance, support, protection and livelihood of the said party of the second part, does by these presents give, grant, aliene and confirm unto the said party of the second part, and to his heirs and assigns forever, all—

[Description of Property.]

Together with all and singular tenements, hereditaments and appurtenances thereunto belonging, or in anywise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof.

To have and to hold, all and singular the said premises, together with the appurtenances, unto the said party of the second part, his heirs and assigns forever.

In witness whereof, the said party of the first part has hereunto set his hand and seal, the day and year first above written. James A. Clayton, [L. S.]

Signed, sealed and delivered in the presence of

Wm D. Bliss,
D. D. Cardes.

This should he acknowledged before a notary, as in the case of other deeds.

MECHANICAL PROGRESS.

The Art of Turning.

The art of turning consists of shaping articles in a lathe. To define the art more closely, we understand it to mean the fashioning of articles that are themselves revolved on the lathe, and which are acted upon by a cutting tool held in the hand, or by a slide rest.

Turning indisputably holds a forward place in the useful arts, and it is one of the oldest. The lathe has been aptly called the "father of mechanism," so much is mechanism indebted to it for its very existence. The date of the origin of the art is lost in antiquity. It was probably known before historians began to write. The potter's wheel is believed to have been the earliest form of lathe. This primitive lethe is now commonly used by the potters of the present day; it is, technically, "a throw." The work that a potter produces with his hands is called "thrown," and the turning is a subsequent process.

The oldest Egyptian monuments had representations of the potter at work with his lathe. This takes us back 2,000 years before the Christian era. Ptah, a god worshipped as the leader of mundane artisans by the Memphites—who flourished about 2,000 years before Christ—is represented in the act of moulding man upon a potter's throw. Thus, we find in the earliest records a special tribute to the art of turning, which, in that remote period, was evidently deemed the art by which man was fashioned. In Scripture history we have, in Jeremiah, a distinct allusion to the potter and his wheel. This date is about 500 years, B. C.

The processes employed by the Hebrews were probably similar to the Egytians, from whom they had learned the art. The wheel used consisted of a wooden disc placed on another larger one, and turned by hand by an attendant, or worked by foot by the potter himself.

Geologists have discovered potteryware in some of the oldest formations which contain human remains; but this pottery was, it is evident, made by hand-moulding, and not by being thrown or turned upon a wheel.

The turning lathe of modern form was apparently not known in those early times. Though many trades and occupations are vividly represented upon the sculptured records of ancient Egyptians, the turner—other than he working at the potter's wheel—is unrepresented. This fact leads to the conclusion that the turning lathe proper was unknown in Egypt.

Turning was evidently one of the arts practiced by the Greeks and Romans. Their writers mention lathes and turners frequently some 500 years before the Christian era.

The early practice of turnery was confined to fashioning wood. We read of bowls, also of flutes, and musical instruments that have been produced by the skilful turner. The application of the art to fashioning metal is of comparatively recent origin.

An attempt to trace the progress of the art of turning through successive generations would probably become wearying. The subject is a very speculative one. There are few indisputable date on which a connected history could be wrought. No treatise on the subject exists, and hence the difficulty in dealing with it.

Long before the fly-wheel, worked by a crank, was invented or used, lathes were driven with the aid of a spring pole, and also by hows; not used in the manner of the modern drill-bow. The pole lathe is still in use in some trades—amongst which that of the watch-case makers—but the alternating motion has been almost entirely superseded by the continuous fly-wheel. Pole lathes are drawn by the foot; an elastic springy pole is fixed by one end—usually to the ceiling—so that the free end is in a direct line with the mandrel pulley. A cord from the free end of the pole is passed around the pulley, and attached to the treadle. When the foot is applied, the mandrel is made to revolve in the direction necessary for cutting; on relieving the treadle of pressure, the elastic force of the spring pole draws the cord back, at the same time causing the work to revolve backwards. In this way the treadle is brought to its original position, ready for another effective stroke.

It is evident that this alternating motion is by no means economical. Every effective movement of the work is only the precedent of an equal amount of non-effective motion. To take the matter at its best, and allow that the speed is in both instances equal, half the time employed in turning is wasted in waiting for the backward motion. Despite this obvious and serious drawback, the pole lathe has been used ever since the invention of the center lathe.

Native turners of Africa and India still practice their art with the primitive pole lathe. A somewhat similar tool, worked with a drill-bow, is use by the Arabs and Persians.

The derivation of the word "lathe" has been attributed to the pole used for working the earliest turning machines. The pole, in order to render it fit for use, was pared down to a taper form, and thus made to resemble a lathe. The English word lathe is one that has been especially bestowed by us. "Turn" is the word applied, in other languages, to the machine. We yet call the smallest form of lathe, in common use among watchmakers, "turns."—*Mechanical World.*

New Friction-Gear for Wire Ropes.

The rapid wear and tear of steel wire ropes for winding at mines, has always been a constant source of complaint, being due, in a great measure, to the sudden checking of the movement by the use of friction clips, especially when there is a heavy strain upon the ropes. Since the latter are by no means cheap, it is important to treat them in such a manner as to keep them in working order as long as possible, and the preservation of wire ropes has, consequently, long been a momentous matter for the consideration of mine owners and mechanical engineers.

An invention has, however, recently been patented, which promises to be of considerable value to all interested. It relates to improvements in brakes for steel, wire and other ropes, and is of more than ordinary interest to those using them. The invention is designed to check the rope without any of the severe punishment caused by hard compression or attrition, and without sensible wearing friction on the rope. For this purpose a brake is fixed, not on the rope itself, but on mechanism connected with V-pulleys, round which the rope is twined, forming a figure 8. The friction on the pulleys is so great, by reason of the turn round each pulley given to the rope, that no appreciable relative motion can take place between the two. As the brake, however, is applied on the axles of the pulleys, or rather on brake wheels on these, or on one of the axles, whatever friction is expended on stopping the rope, is spent on the brake block or the belt and brake wheel, and not on the rope.

The apparatus is simple and effectual. Upon the overhanging ends of two shafts, having bearings in a stout frame, four pulleys are placed, two on each shaft, connected by spur gearing. On the other ends of the shafts are placed two brake wheels with a single brake strap, so arranged that a man, by means of a lever, can put a sufficiently powerful strain on the brake strap, so as to give the brake the requisite power. Upon one of the shafts is a worm wheel, or first wheel of other train of geering, and a clutch, so arranged that the geering can be connected with the shaft at a moment's notice.

The rope is passed from a reel through a guiding eye on to one of the other pulleys, around which it passes. It is then wound around the other outer pulley in the opposite direction, then around the opposite inner pulley, the direction being the same as in the first instance, and finally round the remaining pulley in the same direction as round the second pulley. The brake can be applied gradually or suddenly without any more friction or severe compression on the rope. By putting the clutch into gear the apparatus becomes a winch, and, the brake being thrown out of action, the rope hauled in. In lowering heavy weights the brake can be applied, the clutch thrown out of gear and the descent regulated with the greatest nicety by hand-pressure on the brake lever. The apparatus is no more severe on the rope when the brake is applied than at other times, excepting, of course, the increased tensile strain necessarily entailed when the lowering of a heavy weight is checked, and while in other winding apparatus, there is the riding of one turn over the other, to the great injury of the rope.

To Clean Incrusted Supply Pipes.—A correspondent of an exchange writes: "One of the most annoying accidents that can happen to the steam-engine runner, is to have his water-supply pipes choked up with lime and other solid incrustations. Especially in the hot-water pipe, lime is apt to settle and incrust on the iron pipes, till they become completely filled up, so that no water whatever can pass to the pump or injector which forces it into the boiler. In such cases it is customary to take up the pipes and try to loosen the solid matter by pounding on the pipe and breaking it out, or by making a fire along its whole length and burning it out. In a very recent obstinate case one end was stopped up with a plug, and, standing it upon end, coal oil was poured in as long as any would go in, and the whole was left to stand till morning, when the whole was slid out in a solid core. While this may not always work, it is certainly worth trial in obstinate cases.

Heavy Forging. — Roache's shipyard at Chester, Pa., has just turned out two monster steamboat shafts, for a new Long Island steamer. They are 40 ft. long hy 30 inches diameter, and weigh over 20 tons each. They are said to be the largest ever forged. The process in so large a work is interesting. The iron used is made up of scrape of boiler plates, nuts, and screws, and horseshoes. These are first run together into bars two feet or more in length. The shaft is built hy adding from four to six of these bars et a time to the end, welding them on in the furnace, and heating them into shape with the powerful steam hammer. Then more are piled about the end of the shaft at a white heat, and welded on in the same way.

Compressed-air Motor.—A trial was made in Philadelphia recently of a compressed-air motor for street cars. An exchange states that it worked very satisfactorily, running back and forth over 400 ft. of track without giving any trouble and without noise.

SCIENTIFIC PROGRESS.

Producing Artificial Indigo Directly on the Fiber.

The Baden Aniline and Soda Works, Mannheim, have taken out several patents, and made additions thereto in accordance with the German law, for the above purpose. Their invention is based upon the fact that by the action of concentrated sulphuric acid on orthonitrophenylpropiolic acid at a low temperature a product is formed, which, on treatment with ferrous-sulpbate (green vitriol), yields a blue coloring matter, similar to indigo. No statement is made as regards the composition of this blue substance. (Baeyer's more recent researches show that this blue substance is indoin, $C_{32}H_{20}N_4O_5$.) Numerous other bodies, such as metals, oxides, sulphides, and salts can be substituted for the ferrous-sulphate. The blue coloring matter dissolves in an aqueous solution of sulphurous acid and alkaline bisulphites. From this solution addition of salts throws down a blue precipitate, soluble in water, but which, on warming, or by contact with acids, is converted into another blue coloring matter which is insoluble in water. These reactions are made use of in the dyeing process. The goods are impregnated with a solution of the sulphurous acid derivative, and the color fixed by steem or a dilute acid bath. Besides grape sugar, or milk sugar in alkaline solution, the sulphides, sulphydrates, polysulphides, sulphocarbonates, and other sulphocarbonates of the alkalies or alkaline earths, and especially the alkaline xanthates, can be used for the reduction of orthonitrophenylpropiolic acid. These reducing agents act already in the cold, and more quickly on warming. They are employed in alcoholic or aqueous solution. In the case of xanthates being used, the formation of artificial indigo chiefly takes place after the solvent has volatilized, *e. g.*, on evaporating to dryness a solution of one kilo. acid (orthonitrophenylprop.), one-half kilo. potashes, and one and one-half kilo. potassium xanthate in one-half kilo. water. The same solution can be used for producing the coloring matter on the fiber, or, better still, alkaline solutions of the acids and the xanthates are successively employed. In this case the formation of the coloring matter takes place also in the cold after drying, and more quickly in a drying chamber.—*Journal of Chemical Industry.*

The Formation of Clouds.—The French Society of Aerial Navigation recently entrusted MM. Dutet-Boitevin and du Hauvel with different balloon observations, among which was the study of the formation of clouds, taking into account the vapor tension in neighboring strata of air, but of different temperature, and also the release of the latent heat of vaporization at the moment of precipitation. The observations yielded the following results: 1. The clouds are formed in the zone of mixture of two layers of air saturated with moisture. 2. The clouds originate in the warm layer and dissolve in the colder layer. 3. They move in the direction of the belt of air which has the highest temperature. 4. The winds which are observed at the surface of the ground, which are only effects of the reaction of the principal wind, may have a hight of several hundred yards, and may have different directions in neighboring localities, while the upper current has a great regularity of direction and intensity.

The Blue Color of Water.—The *Photographic News* states that Mr. Aitken has been studying the blue color so characteristic of the Mediterranean and the Lake of Geneva, and his conclusions are embodied in a paper recently presented to the Royal Society. Mr. Aitken begins by saying that two solutions have been offered of this puzzling problem—the one explained the color as due to reflection of small suspended particles which did not reflect the lower rays of the spectrum, and the other, that the color was the result of the absorbent action of the water itself upon the white light, before and after reflection of these particles. The latter theory Mr. Aitken holds to be the true one. The smaller the number of white reflecting particles the darker or greener the water appears to be, Mr. Aitken having been successful in turning the still green water of lake Como into a bright blue by scattering finely divided chalk in the middle of the lake.

How to Increase the Light of Gas Flames.—Mr. W. Lacellee Scott, lately stated that he had arranged an ordinary fish-tail burner at an angle of from 60° to 45°, and allowed finely divided alkaline earths to percolate through the flame; and he found that without any increased consumption of gas, a fairly marked increase of light resulted. The mean results of several experiments were as follows: With a normal flame of 16 71 candles, the addition of pure lime gave 17.95, of magnesia 17.13, and, curiously enough, of an intimate mixture of lime and magnesia, a larger increase than either separately, namely, 18 23. The same mixture, with the addition of 10% of another earth, gave 18.34. With a specially constructed Argand burner, the flame being conical, the light was raised from 62.4 candles, burning gas alone, to 67.3 with the addition of lime only, and with lime and magnesia to 68.5.

Disintegration of Tin.

The question of the real causes of the so-called desaggregation of tin remains still an open one. Thin sheets of the metal especially will sometimes, if exposed to the cold for long periods, be covered with blisters, become brittle, fall to pieces and finally to powder. The crystalline texture assumed under the influence of cold has been advanced as the probable cause of this peculiarity, while Prof. Rammelsberg suggested a dimorphism of tin based on investigations which revealed a decrease of specific gravity in the desaggregated tin, the common specific gravity being 7.29 and that of this modified tin only 7.14. A case was reported in which good commercial tin with the usual amount of .3% of lead was, during its transport from Rotterdam to Moscow in a very cold winter, changed into the gray powder described by prior observers. Discussing this and other occurrences, it was pointed out that continuous vibrations, such as would result from variations of temperature, probably exerted considerable influence in promoting phenomena as here mentioned. The following remarkable occurrence, however, clearly shows continuous concussions are not absolutely necessary to produce this phenomenon. In a corner of a window in Freiberg cathedral, that had been built up for a long time, a wooden box was found which, when opened, not without some shaking, showed the fragments of a tin medal and ring, small pieces af a reddish-gray color with the surprisingly low specific gravity of 5.8. In this case, as in the others mentioned, a metal with the usual brightness, specific gravity and other qualities of tin were reobtained simply hy heating the gray pieces to the temperature of boiling water. At present, attention is drawn to this phenomenon hy an observation of Mr. W. Markownikoff, of Moscow. Some of the tin cans kept in a cold room in one of the government buildings at Moscow showed blisters, then holes and finally fell to powder. Once set in, the process could not be stopped hy removing the cans to a warm room; the destruction ceased, however, if the attacked spots were cut out. None of the cans in use exhibited this desaggregation. Mr. Markownikoff thinks that more or less rapid cooling predisposes the tin to this decay, which is favored hy low temperatures.

Interesting Meteorological Collection.—Prof. F. Mandoj, of Albano, Italy, recently described a meteorological phenomenon which he observed at Noci, a village between the Adriatic and the Gulf of Tarentum. The sky, which had been clear the whole morning, with a cool and pleasant breeze, began to darken soon after noon, with clouds indicating a storm from the south. About 4 o'clock other clouds came rapidly from the northwest, from which a gentle rain fell. The south wind soon increased, driving its clouds before it, and accompanied by a violent rain and numerous terrible peals of thunder. When the clouds from the south passed those from the northwest, the flashes passed between the strata of cloud so rapidly and yet so silently as to produce the appearance of majestic columns of light, lasting in some cases as much as seven seconds. Prof. Mandoj supposes that the two clouds were charged with electricity of the same kind, but, as they were moving in different directions, they might he compared to an immense electrical machine, of which the upper cloud was the conductor, the lower the disk, and the wind the motive force. The moisture of the air served as a conductor for a continuous silent discharge of the electricity that was induced by the motion of the clouds. In order to test his theory, he connected an electrical machine with an insulated disk. Upon electrifying the disk with electricity of the same kind as that of the machine, and moistening the air between the disk and the ground, while the machine turned rapidly in a warm and dry air; he produced columnar flashes similar to those of the storm.

Effect of Manganese on Brass.—An alloy containing 70% of copper and 30% of manganese is employed in Germany as an addition to brass and bronze, in order to increase the density, the tenacity and the ductility of those metals. The manganese, in consequence of the ease with which it oxidizes, prevents the formation of the oxides of copper or tin, which, in the ordinary process, alter the nature of the product. The employment of metallic manganese is also recommended for the same purpose. The addition of from ½% to 1% of the manganese, or of from ¾% to 3% of the alloy of manganese and copper, produces castings without blow-holes. A larger proportion of manganese hardens the metal and gives to the bronze properties similar to those of steel.

Metallic Designs on Glass Obtained by the Aid of Photography.—An ingenious method of obtaining mirror-like designs on glass has been devised by Leclerc. The glass, having been silvered by the chemical process, is coated with a thin and uniform layer of sensitive bitumen, and this is exposed under a transparency, the next step being to wash away the unaltered bitumen with oil of turpentine, so as to leave the bituminous design on the silvered glass. The application of moderately strong nitric acid removes the silver, excepting where it has been protected by the bitumen, so that the metallic design shows like a mirror from the reverse side of the glass. The plate may be backed by paint or any other suitable material.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Apr. 6.		Week Ending Apr. 13		Week Ending Apr. 20		Week Ending Apr. 27	
Alpha	50c	35c	75c	45c	1.15	50c	1.10	90c
Alta	3.05	2	3.40	2.60	3.40	2.55	2.55	2.05
Andea	55c	50c	85c	55c	80c	75c	70c	60c
Albion	2 90	2.30	2.95	2	2½	2.10	2.15	2.05
Argenta	10c	....	10c	5c	5c	....	5c	....
Addenda	15c	....	5c	....	....	....	....	....
Belcher	50c	45c	55c	40c	50c	40c	60c	45c
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	5⅞	4.30	6¾	4.65	6⅞	6¼	5⅞	5¼
Bullion	30c	20c	30c	20c	65c	25c	20c	....
Bechtel	30c	....	25c	....	25c	....	25c	....
Belle Isle	....	....	....	....	....	....	....	....
Bodie	5¾	4¾	5¾	5¼	6	5¾	6	5¾
Benton	40c	20c	80c	25c	80c	55c	60c	50c
Bulwer	....	....	2¼	....	2.20	2.10	....	....
Boston	40c	30c	25c	....	....	....	30c	....
Black Hawk	10c	....	10c	....	10c	....	....	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	10c	....	....	....	....	....
Caledonia	....	....	....	....	....	....	....	....
California	15c	10c	20c	10c	15c	10c	10c	5c
Challenge	15c	....	....	....	....	....	25c	....
Chollar	1.10	65c	1.15	85c	1¼	1	85c	75c
Confidence	50c	....	75c	65c	80c	....	80c	75c
Con Imperial	....	....	....	....	....	....	....	....
Con Virginia	60c	50c	75c	55c	65c	70c	70c	60c
Crown Point	45c	40c	50c	40c	70c	55c	65c	60c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	15c	....	....	....	....	....
Concordia	2.65	2¼	2.25	....	1.30	1¼	1.35	1¼
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	30c	....	25c	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	9.05	1.90	1.90	1.70	1.85	1.65	1¾	1.60
E. Mt. Diablo	20c	15c	15c	....	15c	10c	10c	....
Eureka Con	22½	20	22½	....	21½	21½	24	22½
Exchequer	25c	15c	30c	20c	35c	25c	30c	25c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	45c	35c	40c	35c	40c	35c	40c	....
Gould & Curry	3.35	1.95	3.45	2¼	8.35	3.15	3.05	2.70
Hale & Norcross	90c	60c	1.40	75c	2.10	1.05	1.60	1.40
Head Center	25c	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	15c	....
Julia	15c	....	10c	....	30c	15c	15c	....
Justice	55c	40c	1.05	45c	75c	60c	55c	45c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	25c	20c	....	....	....	....	25c	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	10c	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1¼	....	....	....	1½	....	1½	....
Martin White	7¾	....	4	....	3½	4.30	4½	4½
McClinton	....	....	....	....	....	....	....	....
Mono	2	1.65	1¾	1.45	1.80	1.40	1¾	1½
Mexican	6¾	4.65	9	5	8¾	8	9¼	7¾
Mt. Diablo	5	4½	4¾	4.55	4½	....	4	3½
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	1.45	1	1.20	1	1.15	1.10	1¼	90c
New York	....	....	....	....	....	....	15c	....
Northern Belle	8	7¾	8¼	8	....	7¾	7¾	7¾
North Noonday	1.35	85c	....	1	95c	1	....	....
Navajo	80c	65c	95c	80c	1.10	1	1.30	1.15
Occidental	80c	70c	1	60c	1	....	1	....
Ophir	2.60	1.90	6	3.05	4.65	4.20	4.60	3½
Original Keystone	....	....	....	....	....	....	....	....
Overman	25c	15c	30c	20c	30c	25c	25c	20c
Oro	50c	40c	50c	30c	35c	30c	35c	30c
Paris	....	....	....	....	....	....	....	....
Potosi	90c	55c	1	75c	90c	85c	80c	65c
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	90c	55c	2	1.20	2.40	1.90	1.80	1¼
Seg Belcher	1¼	1	1¼	....	1¾	....	2.30	2
Sierra Nevada	6¾	5	9¼	5⅝	8	7¾	9¼	6¾
Silver Hill	15c	10c	20c	10c	20c	15c	....	....
Silver King	17	16	17	16¾	17¼	16¾	17	....
Succor	....	....	....	....	....	....	....	....
Summit	20c	10c	....	....	20c	....	20c	....
Scorpion	65c	45c	75c	70c	1	90c	1	80c
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	35c	30c	30c	....	30c	....	30c	20c
Flora Con	30c	25c	20c	....	25c	20c	20c	....
Tiptop	....	3¼	3.60	2.80	4¼	4	4	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	9¼	6	17¼	7¾	13¾	11¼	15¼	12¾
Utah	3.70	2.60	6¾	3.15	5¾	5	5¾	4.65
Ward	3¼	....	3¼	....	3½	....	3¼	....
Wales	60c	....	60c	55c	55c	....	55c	45c
Yellow Jacket	1	90c	1.15	95c	1.10	1.05	1¼	1

Sales at S. F. Stock Exchange.

Thursday A. M., Apr. 27.

800	Alta	2.55@2.40	
50	Alpha	1.10	
30	B & Belcher	5⅞	
80	Belcher	.60c	
5	Bullion	.2?c	
150	Benton	.55c	
2305	California	.10c	
720	Con Virginia	.70@65c	
110	Chollar	.85c	
50	Crown Point	.65c	
100	Confidence	.80c	
50	Challenge	.25c	
150	Exchequer	.30c	
320	Gould & Curry	3.05	
130	Hale & Nor	1.60	
250	Justice	.55c	
100	Julia	.15c	
20	Kentuck	.25c	
415	Mexican	.9?@9	
5	New York	.15c	
1775	Ophir	4.30@4.60	
150	Overman	.25c	
200	Potosi	.75c	
850	Savage		1?@1.10
900	Sierra Nevada		9?@9¾
950	Scorpion		1
15	Utah		5?@5?
1270	Union		15?@15
50	Ward		3¼
650	Yellow Jacket		1?

AFTERNOON SESSION.

50	Argenta		.10c
50	Alhiou		2.10
30	Bechtel		.25c
125	Bodie Tunnel		1.35
100	Day		1.90
500	E Mt Diablo		.10c
200	Eureka Tunnel		.30c
150	Goodshaw		.40c
205	Mono		1.65@1?
300	Mt Diablo		3.90
100	Northern Belle		.8
100	Navajo		1.80
950	Noonday		1.65
650	Oro		.30c
50	Pinal		.2?
100	Wales		.50c

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Alice, April 19th, $16 800; Monlton, to April 10th, $17,C00; Live Yankee, 21st, $4,179; Tehama, 18th, $4,200; from Silver City, Idaho, 18th, $14,350; Barbee & Walker, 18th, $1,022; Horn Silver, 19th, $25,000; Hanauer, 19th, $2,225; Stormont, 19th, $3,100; Frisco, 20th, $5,531; Frisco, 22d, $5 306; Barbee & Walker, 22d, 1,322; Stormont, 23d, $7,000; Christy, 19th, $21,000; Northern Belle, 17th, $9,370; Wai Wera, 19 h, $1,589; Eureka Con., 16.h, $43,-885; Mt. Diahlo, 18th, $5,159; Standard, 18th, $16,122; Contention, 18th, $11,460; Eureka Con., 18th, $10,229; Christy, 24th, $2,220; Star, 19th, $2,083; Bodie, 24th, $8,464; Tiptop, 17th, $10,139; Northern Belle, 20th, $7,554; Bodie Tunnel, 18th, $2,540; Union Con., 23d, $37,403; Silver King, 24th, $18,700; Mt. Diahlo, 22d, $9,613; Noonday, 18th, $4,921; North Noonday, 18th, $5 519; Eureka Con., 20th, $10,420; Savage, 22d, $3,500; Bodie Tunnel, 25th, $3,446; Contention Con., 25th, $13,242.

DURING March 14,697 emigrants left Hamburg, mostly for the United States.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Albion Con M Co	Nevada	10	30	Mar 6	Apr 10	May 2	D B Chisholm	327 Pine st
Alpha Con M Co	Nevada	15	50	Mar 20	Apr 26	May 19	Wm Willis	309 Montgomery st
Argenta M & M Co	Nevada	10	10	Apr 12	May 19	June 12	E M Hall	327 Pine st
Belcher S M Co	Nevada	30	25	Apr 14	May 17	June 5	J Crockett	327 Pine st
Belmont M Co	Nevada	31	15	Mar 11	Apr 17	May 15	J W Pew	310 Pine st
Belvidere M Co	California	13	25	Feb 9	Apr 12	June 8	C V D Hubbard	310 Pine st
Benton Con M Co	Nevada	7	25	Mar 10	Apr 14	May 4	Wm H Watson	302 Montgomery st
Best & Belcher M Co	Nevada	23	50	Apr 5	May 11	June 2	Wm Willis	309 Montgomery st
Bullion M & M Co	Nevada	23	30	Mar 29	May 2	May 24	J M Brazell	328 Montgomery st
California M Co	Nevada	3	20	Mar 29	May 6	June 5	G P Gordon	309 Montgomery st
Fair Villa M Co	Arizona	1	2½	Apr 24	May 29	June 19	J H Sayre	330 Pine st
Goodshaw M Co	California	10	10	Mar 21	Apr 22	May 13	C C Harvey	309 Montgomery st
Hale & Norcross S M Co	Nevada	73	50	Mar 14	Apr 18	May 10	J P Lightner	309 Montgomery st
Iowa M Co	Nevada	16	03	Mar 6	Apr 15	May 6	C C Leavitt	411½ California st
Leeds M Co	Utah	6	30	Feb 23	Apr 3	May 1	D B Chisholm	327 Pine st
Mayflower Grav M Co	California	15	10	Mar 7	Apr 11	May 3	J Morizio	328 Montgomery st
Mexican G M Co	Nevada	18	1 00	Mar 13	Apr 15	May 9	G L McCoy	309 Montgomery st
Napoleon M Co	California	8	5	Apr 20	May 22	June 8	H Smith	307 Montgomery st
Navajo M Co	Nevada	10	20	Mar 7	Apr 27	May 22	J W Pew	310 Pine st
New Coso M Co	California	13	10	Mar 30	May 1	May 22	D B Chisholm	327 Pine st
Niagara G & S M Co	Nevada	6	20	Apr 1	May 3	May 25	O C Miller	409 Montgomery st
North Gould & Curry G & S M Co	Nevada	2	20	Mar 18	Apr 19	May 11	O H Mason	331 Montgomery st
Onbir S M Co	Nevada	41	1 00	Mar 7	Apr 8	May 2	C L McCoy	309 Montgomery st
Pinal Con M Co	Arizona	3	30	Apr 3	May 3	May 23	W W Traylor	309 Montgomery st
Potosi M & M Co	Nevada	8	50	May 12	June 16	June 6	W E Dean	309 Montgomery st
Quartz Mountain M Co	Calif rnia	14	75	Mar 16	Apr 24	May 24	E Hestres	729 Montgomery st
Savage M Co	Nevada	50	50	Mar 7	Apr 10	May 1	E B Holmes	309 Montgomery st
Scorpion S M Co	Nevada	11	10	Mar 9	Apr 13	May 4	G R Spinney	310 Pine st
Sierra Nevada S M Co	Nevada	72	1 00	Mar 23	Apr 26	May 15	E L Parker	309 Montgomery st
Silver Lick Con M Co	Nevada	1	05	Mar 29	May 6	May 27	L D Carnall	Montgomery Block
Silver Belt M Co	Arizona	1	15	Mar 8	May 17	May 15	J W Pew	310 Pine st
Silver Hill Q M Co	California	2	25	Apr 12	June 10	July 10	J W Pew	310 Pine st
Star M & M Co	Nevada	10	10	Mar 22	Apr 22	May 15	Wm S euart	320 Sansome st
Tellurium G & S M Co	California	25	10	Apr 1	May 8	May 24	H P Bush	431 California st
Union Con S M Co	Nevada	19	1 00	Mar 21	Apr 25	May 15	J M Buffington	309 Montgomery st
Utah S M Co	Nevada	38	1 00	Mar 11	Apr 14	May 3	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Arizona-Utah M Co	Arizona	2	01	Mar 7	Apr 21	May 12	N C Carnall	320 Sausome st
Caledonia M & M Co	Nevada	12	25	Apr 5	May 18	June 15	W Letts Olliver	323 Montgomery st
Compromise M Co	Nevada	1	20	Feb 14	Apr 18	May 5	D Buck	309 Montgomery st
Equator M Co	——	——	20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Golden Fleece Grav M Co	California	25	30 00	Apr 15	May 20	June 8	F Schirmier	7?5 Folsom st
Holmes M Co	——	4	10	Apr 4	May 8	May 29	E A Holmes	318 Pine st
Lima Con M Co	——	1	05	Mar 31	May 5	May 31	R D Hopkins	436 Montgomery st
Metallic M & M Co	——	——	20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Metallic Equator M Co	——	——	20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Monumental Tunnel M Co	California	2	05	Mar 31	May 3	May 22	D B Chisholm	327 Pine st
Mt Auburn M Co	California	7	10	Mar 11	Apr 11	May 11	J T Newell	330 Pine st
Peabody M Co	Nevada	4	05	Feb 25	Apr 10	Apr 29	R D Hopkins	436 Montgomery st
Santa Anuita M & M Co	California	3	03	Apr 17	May 22	June 12	J M Buffington	309 California st
South Bodie M Co	California	6	15	Mar 27	May 2	May 25	Henry Doas	309 Montgomery st
Tower Con M Co	Nevada	1	10	Mar 7	May 12	June 1	G W Sessions	309 Montgomery st
Wide Awake P & M Co	Arizona	16	10	Mar 17	Apr 29	May 25	C Hilsterbrandte	cor Bush & Kearny
Western Home M Co	——	3	05	Apr 10	May 11	June 15	A Halsey	323 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Atlas M Co	——	L Berger	327 Pine st	Special	May 6
Black Bear M Co	California	W Letts Oliver	328 Montgomery st	Annual	May 1
Buckeye M & M Co	Nevada	W H Lowdeu	213 Sansome st	Anuual	May 1
Con Imperial M Co	Nevada	W E Dean	309 Montgomery st	Annual	May 3
Justice M & M Co	Nevada	R E Kelly	419 California st	Annual	May 1
Maryland Con M Co	——	E P Farnsworth	219 Sansome st	Annual	May 6
Morgan M Co	Nevada	C L Tilden	533 Kearny st	Annual	May 6
Mt Potosi M Co	Nevada	J H Sayre	330 Pine st	Special	Apr 29
Woodville Con S M Co	Nevada	R E Kelly	419 California st	Annual	May 1

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Apr 12
Contention M Co	——	D C Bates	309 Montgomery st	25	Feb 28
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	Apr 27
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Apr 11
Silver King M Co	Arizona	J Nash	315 California st	25	Apr 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Apr 12

The Mining Share Market.

There has been a little spurt in mining stocks within a day or two, through it has not amounted to much. As to Comstock matters, Supts. Patton, Taylor and Forman, the committee appointed to draft plans for draining the flooded mines, have agreed that the cheapest and quickest, therefore the best, plan of draining the mines, is to move the Belcher pump and set it up at the Yellow Jacket shaft. The pump can he removed, set up and put in operation in about four months. Meantime the Yellow Jacket pump will have lowered the water to the 2300 level, which, it is said, may readily he done. The Belcher pump will then he ready to join in, and the two pumps will make very short work of the water. Also, while the Belcher pump is being set up, a drift will he run to connect the Belcher mine with the Sutro tunnel. This drift will he run from the nearest point on the south branch of the Sutro tunnel to the Belcher openings, and will he utilized in freeing the lower levels of water.

Dividends this month from prominent incorporated mining companies have amounted to $427,250, as against $457,000 for same month in 1881. Those companies paying this month were the Black Bear, Bulwer Con., Contention Con., Copper Queen, Deadwood Terra, Eureka Con., Homestake, Idaho, Northern Belle, Ontario, San Francisco, Silver King and Standard.

In the old bonanza mines work is going on as usual and at the usual points. Connection will shortly he made on the 2300 level between the Best & Belcher and the Con. Virginia.

At the Savage they are now getting into interesting sections of ground, both on the 2400 and 2200 levels. The Hale & Norcross, Chollar and the Potosi are vigorously exploring ground wholly new. In one or more of these mines ore is liahle to he found at any time.

The Mexican drifts on the 2700 level will soon he connected. They are now so close together that it is necessary to use some precantion in hlasting. This very important connection will undoubtedly he made within a few days. When it has been made, the work of exploring the ore cut some time since will he resumed. It may yet prove to he the continuation of the hody found on the 2500 level of the Union. The north drift on the 2900 level of the Mexican is fast moving up into this region.

THE city of Richmond, Va., will be 100 years old on July 3d, and is thinking about a celebration.

More Debris Suits.

It would seem, after all the time, trouhle and money spent on the famous Gold Run suit, that the Sacramento people might wait until that was settled before hringing new suits. The Gold Run suit has been argued and is now under advisement hy the judge who tried it. The case was well known to be a test one, and is so recognized hy hoth sides. Now, however, new suits are to be instituted, since Sacramento's Supervisors, hy a vote of four ayes to three noes, adopted the following:

Resolved, That George Cadwalader, our special legal counsel, institnte and take the necessary legal steps to enjoin and restrain all the hydraulic mines and mining corporations from nsing the hed of the American river and its trihutaries as a place for the deposit of their tailings or mining tiehris, also all the hydraulic mining companies operating on the Cosumnes river, from using the hed of Cosumnes river for the deposit of their tailings and debris in said river.

"The effect of this resolution," aptly says the Grass Valley *Union*, in commenting on it, "if injunctions can he obtained, will stop all kinds of mining on the American and its trihutaries—har and hank minings as well as that generally designated as hydraulic, where a large quantity of water under pressure is used. Bank mining on the American has been carried on for 30 years without interruption, and the only way in which such claims can he worked is hy tailing into the streams. These are generally owned hy individuals or partnership associations, and not hy large corporations, and they could not afford, of themselves, to defend in expensive suits. The proposition to hring a series of suits against the miners has a look of maliciousness on the part of the anti-debris people of Sacramento county. An important suit has been tried, and a decision is pending, in which the right of miners to use the streams for tailings is involved. It is an important legal question, and the final decision will establish the rights of all parties. Why not wait for the outcome of this case, instead of hringing a multiplicity of suits that can only resnlt in vexing defendants, proving very expensive, and creating further embittering feeling."

W. A. NEWELL, ex-Governor of New Jersey, and now Governor of Washington Territory, has hcen appointed President of the Seattle, Puget Sonnd and Bay Harhor Railroad and Transportation company, now about to he huilt along the Pacific coast in Washington Territory.

MINING SUMMARY.

The following is mostly coudensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

POTOSI.—Amador *Ledger*, April 22: Tbis miuo was shut down, temporarily at least, on Saturday morning. The mill was kept running for a few days longer. The state of affairs seems to he that so far the ore has net yielded sufficient gold to pay. It is claimed hy some that in previous runs a large percentage of the gold has been lost. In order to test this theory the last run was made under the supervisiou of another experienced millman, and on the clean-up will depend whether the mine will start up again or not. Parties interested left Saturday morniug to consult with other stockholdera in regard to the future course.

BUTTE.

SALE OF MINING PROPERTY.—Oroville *Mercury*, April 21: In November, 1880, E. M. Woodman, J. J. Wichmau, C. H. Rollins and John Bovey located the Baranka quartz ledge, situated about 3 miles west of Enterprise, near the Mooretown road, in this county. This claim they developed by tunnel some 200 or 300 ft in length, which disclosed a vein about 4 ft wide. A 4-stamp mill, no ey water, was erected and the rock crushed, which paid $17 a ton. Recently this property attracted the attention of Messrs. J. F. Knox and I. R. Hall, of San Francisco, who made an offer of $10,000 for it, and the property changed hands, the last figure on Monday last, having been negotiated by Major A. P. Jones. We learn that a company has been formed and incorporated, under the name of Baranka M. & M. Co., to work the mine, and that operations will forthwith hegin upon a more extended scale than formerly. The mine is highly spoken of by all who are familiar with it, and, as the new owners intend to work it for its merit, it will no doubt add materially to the bullion product of this section in the near future. The purchase includes a ditch about 1½ miles long, which conveys water from the South Fork of Feather river to the mill.

THE CHEROKEE STRIKE.—On Friday of last week a notice was posted up at the store of the Spring Valley Hydraulic Gold Co., in Cherokee, to the effect that no wages would be paid employees until the latter part of July or the 1st of August; that employees wishing to stay could get provisions and a limited amount of cash at the company's store, while those desiring to quit work could get their money by calling at the company's office. Nearly all the men quit work that day, but most of them returned to their labors on the following morning, and but very few of them left. There was no serious trouble, and everything is now satisfactory.

CALAVERAS.

MACHINERY.—*Mountain Echo*, April 16: We learn from Supt. Scribner that the Gold Cliff M. Co. has purchased and shipped from New York a steam engine, boiler, track cars and all necessary fixtures for a 60-stamp mill, and, if the ditch company can furnish water enough, they will put up another 40-stamp mill, to be run by water.

LINDSAY & Co. have spent considerable time and money in making the necessary preparations to work their mine to advantage. The present works are located upon the north side of the hill upon which the mine is situated. A track has been laid about 400 ft in length, entering an open cut about 40 ft in length where the tunnel starts, and will have to be run nearly 300 ft before reaching the main shaft. This company has gone to work in the right way to open the mine, and will evidently get well paid for this labor.

WILL START UP.—Calaveras *Chronicle*, April 22: We are informed that the Gwin mine, which has been idle during the winter months, will resume active operations about the 1st of next month. Last Monday men were set to work making repairs and getting things in readiness, which will probably take a week yet to do, when a force of 60 men will he employed and everything set to running. The rock will be taken from the 400 level.

GLENCOE.—Last Saturday we made a visit to the prosperous camp of Glencoe, and everything appeared active and lively. The mills at the time were not running, they had huilt just made a clean-up. Quartz was being hauled to the Nonwich mill, and it was expected to start crushing again in a few days. Prospecting is being pushed vigorously in the Valentine. The San Pedro is being worked. Clark's hydraulic was put in operation a short time ago, in Specimen gulch, and it is at present running in full blast. Lewis & Fairchild are still taking out rock that will pay handsomely to crush in a hand mortar. They expect to mill their rock in June. We predict that they will then make the biggest clean-up ever made in that vicinity. Work will be pushed in the mines of West Point and vicinity in about two weeks.

EL DORADO.

RICH GRAVEL.—*Mountain Democrat*, April 22: Quite recently fine strikes have been made in the Lyon gold gravel mine, at Prospect flat, two miles above this city, and in the Cedar Springs mine, in our immediate suburbs, of enormously rich gold-bearing cement. Both of these mines belong to a Boston company, and are under the superintendency of Capt. Samuel Hutchinson. Although the two mines are but a short distance apart, the gold they produce and the cement in which the gold is found are of a widely different character. The cement from the Lyon mine is clayey, and light gray in color; that from the Cedar Springs mine contains more sand, and has a reddish tinge. The gold in the former is found in exceedingly fine particles, thickly disseminated throughout the cement; the gold from the latter is coarse, the particles averaging about the size and generally bearing the shape of cucumber seeds, but ranging from the size of an ordinary pinhead to pieces weighing a half ounce or more. We have been permitted to inspect chunks of cement from the Lyon mine, 8 to 10 inches across in either direction, and where the surface has been made smooth and sleek, by contact with a bowlder, streaks of fine gold, 1 to 3 inches across, may be seen meandering like a stream across the masses. Chunks of cement have been taken from the Cedar Springs mine, from pieces of which, about the size of a man's fist, and weighing about a pound, coarse gold to the amount of $12 to $15 has been picked out with the point of a knife-blade. It is not considered extravagant to estimate that there is cement being taken from either of those mines that will yield $20 a pound. From present indications, we anticipate that within a short time crushings will he made at these mines that will surpass, for a single day's output, anything that has ever been witnessed in these parts.

ONION VALLEY.—Georgetown *Gazette*, April 21: The Onion valley miners are beginning to return to their claims. The snow is yet some 2 ft deep on all but some favored sunny slopes, where some of the mines have already been started up. The season will be a much hetter one than last for a free water supply, as the snow fall has been fully double.

SPANISH DRY DIGGINGS.—A great part of the time during the past winter, when the weather permitted, prospecting has been carried on in this district, with varied success, but generally favorable, for there are very few spots around here that do not show gold, and now that hetter weather is apparently with us, the prospector is rigorously at work—all the indications showing that life, activity and prosperity will once more hold sway, as they did in former days, bringing this favorite old mining camp again to the front.

INYO.

HOPE.—Inyo *Independent*, April 20: Reports reach us of the discovery of an immense mineral ledge in Wild Rose district, 81 ft wide and assaying 60 ounces per ton in silver. Fitzgerald intends putting a mill there as soou as his present Modock run is completed.

GOOD.—Whether mining business in this part of the county amounts to much or not this season, it is ovident

that there will be an immensely increased output of bullion from Beveridge, Darwin, Lookout and Panamint probably more than ever before in any one year.

Ivy Springs.—Messrs. Greenly & Broder are at work again sinking the shaft on the Indian Scout, with the most encouraging results. They have built a trail directly across to the mines from McMurry's ranch. The Half Dollar boys have developed a splendid body of ore in their shaft. Mr. Ellsee is getting out a lot of rich ore for shipment to the reduction works at Dayton.

Kearsarge.—Mr. Ward and his co-workers, who are rebuilding the old Pioneer mill in Kearsarge district, will have entirely completed the road by the middle of next week. The Kearsarge grade has been put in good order. Considerable parts of the mill are in place, and the new 20-ft water wheel will be finished within two weeks after the arrival of the necessary lumber, so that Mr. Sullivan intends having the works ready for operation about the middle of May. Several lots of ore will be worked, besides the Kearsarge tailings. Todd & Clinton have added 15 ft to the depth of the winze in the Kearsarge tunnel, making it about 120 in all. Both ore and mill found the same body continue to the full depth of 50 ft more there will yet be lively work on the big mountain.

The Modock.—Up to the 13th inst. the amount of ore delivered at the Modock furnace was 309 tons. Ore chutes at mine are all full. The 300 level of the East Lookout, north drift, is all ore of high grade. The old Confidence stopes are yielding the usual amount of ore. The prospect drift from the blacksmith shop is in 75 ft, and shows a little carbonate in the face. The furnace will be fired up at 6 o'clock A. M. May 1st.

Snow's Canyon.—Joe Le Cyr's big team was in town yesterday, loading with grain for Darwin and Snow's canyon. We learn that mining operations are being very considerably revived in the latter district. John Eddy, who has the mill and mines under lease, has about 15 men working the different claims. He reports a strike in the St. Louis mine, of an ore vein 2 to 4 inches in width of immense richness—from $12,000 to $14,000 per ton in gold.

MARIPOSA.

Good Ore.—*Gazette*, April 22: Col. Swalley and Geo. Schofield, who went out to the mine on Whitlocks yesterday, returned, bringing with them specimens of ore taken out some 20 years ago, which had been thrown aside with other refuse rock. The character of the rock is the same as that taken from some of our best mines, and it stands to reason, judging from the specimens shown us, that the rock selected must have been good, or so much labor and milling would not have been done at the time.

NEVADA.

Work.—Grass Valley *Tidings*, April 22: The Gray Hound company is pushing work forward with a vim out on their claim, on the north side of Alta hill. The Gray Hound was formerly the Jenny Lind diggings, and was worked with the view of striking gravel. There is a good quartz ledge on the claim, which will shortly be reached. Work on the O'Connor mine is going steadily forward, both tributers and millmen being constantly employed. Good rock is being taken out for milling by a tribute party. It is expected that the mill, which will be almost new, will be ready in about 5 weeks. The Town Talk gravel mine is being worked with energy and it was expected that gravel would be reached last night. This claim is located at Sutton's ranch, and promises are very favorable. There is an upper tunnel on the property 650 ft in length, and an incline in this 30 ft in depth in which a good bed of gravel was struck, but on account of water, work had to be abandoned in the incline. Another tunnel was run a distance of 700 ft and an incline 62 ft sunk from which an upraise is being made to strike the gravel. The Idaho is keeping up its regular lick of turning out gold. The ledge is somewhat improved in quality since our last statements. A new shaft is being sunk on the Ontario mine. Rock in the first shaft became so hard that it could not be worked, hence the new shaft, which is an incline one. The imperial Co. are still working on Deer creek. The ledge will shortly be cut. The Empire is looking as well as it ever did, and it is one of the oldest-worked mines in the district. The mill is running night and day on good ore. The New York Hill mine is improving. The ledge looks much better than it has of late. The ledge in the lower level is widening out and is of good quality.

PLUMAS.

The Bio Pipes.—Plumas *National*, April 20: Orr & Co., on Hungarian hill, have started up, and now have plenty of water, with acres of pay gravel to work on. They should make a splendid run this season. The Plumas Water Co. is also piping, but their water has so far been a little short, the cold weather having kept it back. They will have plenty from now on, and the big banks of snow in the mountains promise a good season yet. Many of the smaller hydraulics will soon start up.

Southern Eureka Mine.—Greenville *Bulletin*, April 19: Yesterday a chimney of very rich ore was struck in the Southern Eureka. Picked up at random on the dump, any piece of the rock shows rich.

Taylor-Plumas Mine.—This mine continues to develop a good wide ledge of rich ore. The gold is not found so much in bunches as before, but is diffused through the entire mass of ledge matter. There is now a good assurance that the erection of a 20-stamp mill will soon be begun.

Cherokee Mine.—On Sunday another battery of 5 stamps was started at the Cherokee mill. The plank road to the mine is now clear of snow and ore can be hauled easier and at less expense than ever before.

The Reservoir.—The water in the reservoir is rising steadily every day, against a full head of water flowing out in the ditch. An immense body of snow is still back on the mountain sides and is melting but slowly, owing to the clear weather and cold nights. Last year the snow was gone by the 1st of March; this season it will not be all gone before the end of May, unless heavy rains should come—something very unlikely to happen. The slow filling of the reservoir is very favorable, as the incoming water brings down but very little sediment and gives time for the new work to settle thoroughly solid.

Green Mountain Mine.—Visiting Green Mountain on Friday everything about the mills and mine was seen in excellent order. The daily cleaning of the plates is giving an excellent yield of amalgam; no retorting had yet been done since the lats start, but there was then a large amount of amalgam on hand, and, after the first general clean-up the produce of the run would be retorted and a large amount of bullion obtained. In a conversation with Mr Frank Rogers, the mine foreman, he confidently asserted that there was ore enough assured now to keep the mills running for the next two years without hanging up a stamp for an hour. The company has sent on two recently patented amalgamating machines, which will be put in position and started up as soon as possible; the machines are small and very little power will be needed to run them.

SAN BERNARDINO.

Calico Notes.—Cor. San Bernardino *Index*, April 22: The general feeling is that this is to be the best and biggest camp in southern California. More work is being done than at any time before, and nearly every man who wishes work has a chance to get good wages. The King Co. has now a well-developed mine, and under the direction of Sam James, is taking out and shipping the best ore that has ever been taken out of the mines. They have 12 men at work on the mine, and have a 3 ft body of ore that will mill in the neighborhood of $1,000 per ton. The drifts in the tunnel are showing good bodies of pay ore throughout their entire length. Their superintendent is the right man in the right place, and by his untiring exertions he has developed a prospect until it shows a mine of fabulous richness. The ore taken out has more than paid the expense of opening, and thousands of dollars' worth of ore now lies on this dump, awaiting shipment. The Moscow mine, which has been but little worked of late, is now being opened in good shape. They have 10 men at work, and are shipping ore to Somers' mill, which is about ready to run. The Oriental Co. has work going on in two of its mines, and it is rumored that it expects to purchase other property and erect a mill near the mines to work their ore. The Little Bonanza Co. are putting men at work, and intend shipping ore to Gra Grande.

SIERRA.

A Valcabe Mine.—*Tribune*, April 20: The Secretary of the Sierra Buttes Co. reports the result of the working at the Plumas-Eureka mines for February, as follows: Sierra Buttes mine—Total receipts, $24,373; total working expenses, $17,933. Plumas-Eureka mine—Total receipts, $26,062; total working expenses, $18,310. The Plumas Eureka clean-up for January was as follows: Total receipts, $35,173; total working expenses, $18,909.

The Wisconsin Owing to the hard rock that it has been necessary to contend with, progress on the tunnel of the Wisconsin mine, which is located in Caribou ravine, has been very slow. The parties who have the contract of running the 500 ft of tunnel do not expect to finish the job before fall, at best. At present the rock is somewhat softer than has heretofore been encountered, but there is no telling how long it will last.

Scales Diggings. The Fairplay M Co. commenced work on the 29th ultimo. About 25 men are employed at that mine. Joe Dean & Co. employ about 16 hands at their claim, and the Union Hill Co. furnishes work for from 20 to 25 men.

TRINITY.

Water.—Trinity *Journal*, April 22: Mr. E. M. Benjamin, mining superintendent, started for San Francisco Friday morning, on business connected with the mines in Junction City district, of which he has charge. We learn that Mr. Benjamin will make arrangements for bringing more water to the mines, and that the work will commence in earnest as soon as he returns.

From Deadwood. Alex. Love and George Hackett have been off for a week's visit, taking in Lowden's ranch, Lewiston, Deadwood and Jake Paulsen's. Alexander tells us that Deadwood quartz is very rich, and that there seems to be plenty of it. The richest he saw was in the Gibson Bros.' tunnel. Supt. Lambart has his mill running in good shape, and is making money fast.

New Riven.—Water is very high, and miners here are making up for lost time during the last three months. So far as heard from, clean-ups thus far have been good, though no one, as yet, has begun to bottom up, and everybody is of the opinion that the present season will be better than the average. The Portuguese Co., on Big flat, last Saturday made a clean-up of 20 ounces from a ten days' run in the upper claim; in another month they will be through ground-sluicing for the season. Carson & Donald will begin to work the bottom in a week. They have sluiced about half the depth of their bank, and this has cleared their expenses for the whole season, and whatever they take out between now and 1st of August will be clear profit. Some of the men who worked the bed of the river on North Fork last summer, with such good results, have again come back, and will put in a wingdam as soon as the danger of its being taken away by any sudden rise is past. S. F. Taylor, on behalf of parties from the city, has bought Mr. Owin's claim on China creek, two miles above Hoboken, and has a force of men at work digging a ditch to bring a good head of water on it. Mr. Brizard's pack train is expected in a few days from Arcata with hydraulic pipes and giant, which will be put in position as soon as possible, as Mr. Taylor is anxious to prospect the claim well before the season's water gives out. There is also considerable talk of renewing operations at Hoboken. Another project spoken of is that of taking water out of the North Fork, high enough to cover all the bars below the forks, including Big flat, Rattlesnake and a dozen other bars that prospect well, but most of which have never been touched for want of water.

TUOLUMNE.

Rappahannock. *Union Democrat*, April 22: Hoisting works in the Rappahannock mine were completed this week. J. A. Davis, the owner, will take the management. He is building a house, and, with his family, will remain until the mine is in thorough working condition.

NEVADA.

COLUMBUS DISTRICT.

Northern Belle.—*True Fissure*, April 22: The mine has shown but few important changes during the week. The main drift on the fifth shaft level has been extended 23 ft, the total length being 57 ft. The formation in the face of the drift is somewhat harder, and showing more quartz. The other shaft levels present about the same appearance as at the time of last report. The yield of ore has been about 57 tons per day. Both mills are running steadily, and are doing the usual amount of work. Bullion shipments amounted to $16 925 13 for the week ending April 20th, and aggregate $37,043.63 to the same date.

Mount Diablo.—The stope above the east drift on the third level does not show quite so well as at the time of last report. The stopes on this level from the west drift, and near winze No. 1, are showing a smaller amount of ore. The ore in the stopes from the second and first levels is much smaller than a week ago, and is of such low grade that it will not pay for the extraction and reduction. It assays about $40 to $50 per ton. There will be ore enough to keep the mill running the balance of this month, but probably no longer. Bullion amounting to $7,899.06 was shipped on the 15th inst., and $6,159.05 on the 18th.

General Jackson.—Work is progressing on this property, and a drift is being run west from the first level of the Silver shaft. Some small veins of chloride are being found as the work progresses.

East Mount Diablo.—The north crosscut is now in 55 ft, and in favorable ground. The south crosscut is in 22 ft from the main east tunnel, the face of which is looking well.

CRABB DISTRICT.

At Work.—Cor. Esmeralda *Herald*, April 22: A correspondent of the *Herald*, writing from Crabb district, under date of April 9th, says: The ditch for conveying water from East Walker river to run the mill, which is soon to be built for the district by H. N Thompson, is completed, and the men have commenced work on some of the mines. Mr. Crabb has three men at work on his Eagle Bird mine, extracting rich ore. This mine is looking well. Crabb says some may tell, on account of prejudice or spite, that this district is a poor one, or there are nothing but blanket ledges in the district, but that will not stop the work, neither will it keep the mines from paying. The work will go on all the same. The Eagle Bird mine cannot be beat in the country, for the amount of work done on it.

ESMERALDA DISTRICT.

The Camp.—*Herald*, April 22: The stormy weather of the past month has retarded the progress of mining and milling to a considerable extent. Although we did not have much snow, the roads were so soft that it made ore-hauling suspend, and the storms were so frequent that they prevented operations on prospecting claims, as the men could not stand at the windlass; but, notwithstanding the inclemency of the weather, some of our mines have made considerable progress. The season has now arrived when we can expect every morning to be a brighter one, and we hope the next thirty days will develop something of interest to chronicle. During the coming week the Silver Hill and Lewis Con. companies expect to commence extracting ore and opening up their mines. Both properties having very rich ore, we can expect developments at any day, whilst they are working, which will increase their value ten fold. The Humboldt West promises to be very profitable to the company. During the past 12 days they hoisted about 200 tons of ore, with 6 men, which is about 4 tons per day to each man, making the cost of breaking and hoisting a very little over $1 per ton, which enables the company to extract and deliver their ore at the mill at a cost of about $2.50 per ton. Their facilities for milling are such that the cost of reduction will not exceed $4.50 per ton, making the total cost of extracting, hauling and milling $7 per ton, which is a very great reduction from the workings of early days (thanks to ex-Governor Blasdel), when the miners had to pay $25 per ton for milling, and it is plain to us that the ores of the Humboldt West will pay a handsome profit over mining and milling. The owners of the Centennial property are busily engaged sinking on the ledge, which continues to improve in appearance with each blast.

EUREKA DISTRICT.

The Monumental Tunnel. Eureka *Sentinel*, April 20: The Monumental tunnel is situated on Prospect mountain, piercing it east of its highest point, and running due east and west. It has on the north contiguous to it two producing mines—the Fourth of July and the Excelsior; on the south it adjoins the Burning Moscow and the Secret Canyon T. & M. Co.'s claims. It is about 1 mile north from the Geddes & Bertrand and the Irish Embassador. The formation is similar to that of the Geddes & Bertrand. It is evidently on the same belt with the Geddes & Bertrand, Eureka Tunnel and other important claims. The Monumental tunnel has been run 115 ft into the mountain. Good indications were found all the way along, and at this point a seam or stringer of galena ore, carrying streaks of black metal, was struck yesterday. The ore has not yet been assayed, but it is evidently a good prospect. It was found in the face of the tunnel, and has not yet been penetrated, hence its dimensions cannot be known. The surface ground above the point of the strike shows a ledge which crops out across the tunnel 100 ft in width. This ledge is the same that was struck below. It is approximately estimated that the distance from the apex of the mountain to the tunnel level is 1,400 ft; the distance on the surface from the base to the apex is 1,800 ft, and the distance from the mouth of the tunnel to a point directly under the apex in a vertical direction is about 1,600 ft.

LEWIS DISTRICT.

Betty O'Neal.—Lewis *Herald*, April 19: The Betty O'Neal is fast coming to the front as the "dark horse" of Lewis. The stopes throughout the mine are working splendid; 6 to 7 tons of rich ore are being extracted daily, which yield could easily be increased. In the south lower level the ledge is now over 6 ft of good milling ore, with stratas of ore running through the ledge, some of them 7 to 8 inches in width, that will assay in the thousands. The ore on the dumps attracts the attention of all passers; it is almost all specimens. We would be glad to see arrangements made to reduce this ore, as we are confident that a large bullion output would be the result.

Morning Star.—The contractors on the Morning Star are making good headway with the Morgan incline.

Starr-Grove.—The pumps are kept running at the Starr-Grove mine, and the water will be kept out till further orders.

ARIZONA.

Groom Creek.—Prescott *Courier*, April 17: Gentlemen who visited Groom Creek district, 6 miles south of Prescott, yesterday, returned last evening well pleased. Mr. Merrington is happy. His new mill has, so far, done good work. An assay of tailings afforded but $2 per ton, so that both free gold and sulphurets have been saved. Assays of concentrations showed that they are worth between $900 and $1,000 per ton. They will, in all probability, be shipped to San Francisco or the East. Another stamp will shortly be added to the mill; it will do custom work and be of great benefit to this part of Arizona.

Bully Bueno.—Arizona *Democrat*, April 15: Mr. Oliver Perry, a gardener and a miner from the old Bully Bueno camp, on Turkey creek, gives a favorable report of the prospects on the creek. Henzey & Co., at the old Bully Bueno mill-site, are getting their mill in condition to start up, and have let a contract to sink 100 ft on the Imperial mine owned by them. If they rig up the mill so as to work custom ores, the old camp would be lively once more, as there are several very promising gold and silver veins near the mill. For instance, the Morning Glory, Yahoo, Holy Terror, Capital, Richmond, Trinity, Impe ial and enough others to make a lively place if the proper facilities for reducing ore are furnished.

COLORADO.

Robinson.—*Mining Gazette*, April 10: For the fiscal year ending March 1, 1882, the net production of the Robinson mine was $1,214,802 50; that is, the company received that amount from ore buyers for the product. The disbursements were as follows: Operating expenses, $416,701.66; purchase of smelter, $87,500.00; paid in settlement of Jacque suit, $100,000.00. Dividends $450,000; expense at New York office, $27,391.37; total, $1,141,596.03. In addition to this sum is an item of $31,000, advanced to Geo. Daly during his management by smelting companies and charged to mining expenses. The strong point in the report is the fact that the operating expenses at the mine consumed less than one-third of the product. While the sum paid for the smelter is properly chargeable to the mine it adds nothing to its value. The $160,000 paid in settlement of the Jacque suit is also chargeable to the property and was a judicious payment. These two sums aggregating nearly $250,000 were paid from the net earnings during the year, and represents an amount which might have been added to the dividends, hence shareowners ought not to waste their strength in useless kicks. It is reasonable to assume that the operating expenses this year will be increased, as the output must come from deeper levels, but so far as one year's history of a mine can be used as a criterion to judge of its future, the out ook of the Robinson is full of promise.

IDAHO.

Wood River Jots.—*Miner*, April 15: The Moffit & Irvine group are located on Warm Spring creek 12 miles northwest of Ketchum and were discovered and located by E. H. Moffit and Robert Irvine, who disposed of them to Col. E. Greene of the Philadelphia Co., about 2 weeks ago, for $40,000. The properties show large deposits of high grade ore, and are a bargain for the purchasor. Six men are now working the claims and are supplied with provisions, powder, fuse etc., by 2 men who make a trip every day between the mines and Ketchum, carrying supplies on hand-sleds, over the mountains. The new acquisitions to the Philadelphia Co.'s properties will receive as rapid development as is practical.

Supplies for the Muldoon.—E. E. Robinson, John Conner and Tom Covert have taken out a month's supplies from the store of J. G. Swift & Co., of this city, to the men working on the Muldoon mines, for the Philadelphia Co., of which that incomparable organizer and able business manager, Colonel E. Greene, is general superintendent.

Another Stack for the Ketchum Smelter.—The second stack for the Ketchum smelter, the property of the Philadelphia M. Co. is on the road from Kelton at this date, and is expected in Ketchum about May 1st. It is thought by those having the management of the smelter that the new stack will be in place and the smelter blown in by June 1st, at the latest. This will make the Ketchum smelter capable of running out 40 tons of bullion per day of 24 hours.

Still Another Sawmill.—A big sawmill outfit is on the road from Kelton to Wood River. It is to be put up some 6 or 8 miles above Hailey, and run at once. We have not learned to whom it belongs.

Hayden at Work.—Idaho *World*, April 18: F. Hayden has been running the pipe nearly 2 weeks in his claim between here and the Warm Springs. The ground below the road is being run off for the purpose of forming dump for that farther up. Moore creek the past few years has filled up with tailings so that the bar is almost level with it, and work is therefore being carried on under great disadvantages. Six hands are at work, most of them engaged in wheeling out, as the bedrock is so flat that the pipe does not work very effectually.

The Forest King.—The Forest King mine, situated about 9 miles northeast of town, continues to show up in splendid shape. Five men are at work stoping an excellent grade of ore. One hundred and twenty tons are already on the dump, and it is the intention of the company to increase the amount until about the last of May, when they will commence shipping to the Sub Rosa mill. Seventy tons of the same character of ore were milled last year and returned a yield of $45, to $50 per ton. The present works are 180 ft from the surface, and at this point the ledge is 22 ft between walls, and the main pay streak is 3 ft in width.

MONTANA.

A New Syndicate. *Inter-Mountain*, April 17: With much pleasure the *Inter-Mountain* informs the public that all doubt as to the immediate future development of the Mountain Con. property has been dispelled. Without going into the particulars of the arrangements, it may be stated that R. C. Chambers, of Salt Lake, and Messrs. Moore, Collingwood and Atwood, of New York, have perfected an agreement to take 175,000 shares of the working stock; that Mr. Walter McKay has been appointed superintendent of the mine, and that energetic operations will be resumed without delay. This information is important for it presages the erection at an early day of another 10-stamp mill in the Butte district. The substantial merits of the Mountain Con. are well known to our readers, and with Mr. McKay in charge of the work of exploration every confidence may be indulged as to the successful future of the company.

The Liquidator.—The Liquidator is a copper property lying east of and adjoining the Colusa. It is owned by Warren, Belk, Foster, et al., and has been under lease for several months to Wm. McDermott, who also had a bond on one-half of the mine. The showing made in the shaft, indicates the ore body to be extensive and to all appearances permanent, and the ore is of sufficiently high grade to insure a good profit over and above the expenses of operation. The lessee is so much encouraged by the appearance of the property that a few days ago he paid $6,000 for 2 quarter interests, and an attempt will be made to induce the parties who own the other half interest to put up their share of money necessary for the thorough development of the mine.

NEW MEXICO.

The Santa Rita Copper and Iron Co.—*New Southwest*, April 15: The mill of the company is working very successfully upon the Santa Rita ores, and now running regularly. It is found that the coarse copper as saved and cleaned up from the batteries twice a day, is running 95% fine and of sufficient purity to ship direct without smelting. The number two concentrations from Jigs run 95% to 75% fine copper, and the number three or slime concentrations run from 30 to 40% fine; both number two and three concentrations go to the smelter. Owing to the nearness of the smelter to the mill and the danger of fire, it has been found necessary to remove the smelting site, which has necessitated a stoppage in smelting of about 2 weeks. The smelter turned out in a few days from 15 to 20 tons of very fine copper, and the company is making its first shipment of 2 carloads of ingot copper to New York. Owing to the large quantity of ore ready for stoping and milling in the Romero mine, the company has suspended mining from the Guadalupe for the present, or until its milling facilities are increased. The company is completing its plans at the new smelting site to run a second smelter.

Pecos. *New Mexico Mining News*, April 16: Very good ore from the mines on the Pecos continues to come in. There is now no doubt as to the fine quality of the ore of the district, and the only question is whether or not there is enough of it. The miners are all very sanguine on this point, believing that there are large bodies of the mineral in the various leads. This, of course, is a matter of conjecture at present, but the character of the mineral is good beyond doubt. The Gonzales concentrator is reported to be running. Ore is being hauled to it steadily, and is accumulating rapidly. The boom at Bonanza has commenced.

Cerillos District.—Mr. Wolf, who is running the reduction works for the M R & Co., is still crushing ore. He says he will not commence smelting until he is ready to start up for good. He wants to be sure that he can run for at least three months when once under headway. The company has had some trouble in getting its Socorro ore which has also delayed its work to some extent. It is expected, however, that the trouble will be a thing of the past this week. Cerillos station now has 3 good hotels and all of them are filled with guests. The town is growing rapidly, and a great deal of work is being done by the miners. The coal company is a great help to the place, and is working steadily. Carbonateville is growing steadily, but not with as great rapidity as Cerillos. Everybody seems to have plenty of work and business is good.

OREGON.

Notes.—Oregon *Sentinel*, April 19: Dick Cook is now in 115 ft on his tunnel on the old Steamboat ledge. He expects to strike the bonanza now in less than 50 ft..... Green Bros. have not crushed any quartz from the Sugar Pine ledge this spring. They are still getting out a fine quality of rock and intend running a new tunnel to strike the ledge 100 ft deeper than where it is being worked.....A partial clean-up which was very satisfactory was made at the Star Gulch mine this week being nearly 40 ounces.....Sterling is running without interruption as also all the other large hydraulic mines in this and Josephine counties.....The late rains have given another start to miners whose water supply was failing.

WYOMING.

Alma Coal Fields—One of the Great Deposits in Wyoming Territory.—Salt Lake *Tribune*, April 19: Alma, Wyoming, on the Union Pacific, 75 miles east of Ogden, is noted for its immense coal mines, operated by the Union and Central Pacific companies. The former has several mines, which are worked to supply the road with coal, besides selling great quantities in Salt Lake and other cities and towns. Most of the coal used on the Utah and Northern is taken from the Union Pacific mines at Alma. The Central Pacific Co. own and operate two mines there, which are opened up to such an extent that when it is required they can turn out 700 tons of coal per day, but the quantity mined is graduated by demand for operating the road and supplying the shops and office with fuel. At present the output is 500 tons per day, which is taken to the various coal stations along the road, as far as Truckee, California, and is used for making steam to operate 600 miles of road. To mine, load and ship this quantity of coal each day requires the labor of 250 men in and around the 2 mines. The quantity of coal required increases each year, and yet the extent of the coal fields of Wyoming and Utah are so vast as to be practically inexhaustible.

UTAH.

Notes.—Salt Lake *Tribune*, April 23: There has been considerable quiet work going on in Ophir district during the winter, and several of the old mines thought to have been played out years ago, will make a big ore record this season. Utah never made a better bullion showing than it is making now, and the outlook for the mines this year was never so promising. Scott & Anderson shipped nearly 6,000 tons of lead last year. Lead is worth in this market $50 per ton, but as the bulk of lead produced in Utah goes direct to owners East, there is little if any in this market for sale. The Morgan smelter sends about 3 cars of bullion per week to Omaha to be refined. All the ore being shipped from the Bingham canyon mines is reduced at the Sandy smelters. The shipments of ore from the Telegraph west extension to Sandy amounts to 400 tons per month. The Yosemite mine, Bingham, is shipping from 200 to 300 tons of ore per month to the Sandy smelters.

The Comet has a good body of high-grade ore in the face of the tunnel. The parties who took the contract have nearly 20 ft to run yet to complete the tunnel, and the ore is getting better every foot. The owners are highly gratified over the result of what work they have done so far, and, as the mine will pay the working expenses, it will likely be pushed ahead the coming summer as fast as possible.

The Hecla mine, in Bradshaw district, owned by Louis Lessing & Co., is being developed as rapidly as possible, under the superintendency of Mr. Lessing, and promises to shortly be a bonanza. A sufficient working capital is already put up to develop the mine, and it is the intention of the owners to open it up and put it on a paying basis as rapidly as possible.

Italian Rocks and Contained Minerals.

(Continued from last week).

3851. Saccharoid, white marble of fine crystalline structure, exactly like some Cerrara marbles. Pont Canavese (Turin). Val Soana, Graian Alps.

3852. Crystalline, white, metamorphic marble, of large open structure. Maniglia (Turin). Valle della Germagnasce, Cottian Alps. The marble of this vicinity is suitable for making columns, and for various architectural works. But for the distance from a railway station, it wonld he largely employed.

3853. Very fine-grained, white, crystalline marhle, showing the contact with the etrata of mice schist. Pont Canavese (Turin). Val Soana, Graian Alps. The marhle of this locality was employed for the royal tombs in the hasilica of the Superga, near Turin.

3854. Open-grained, crystalline, metamorphic marhle, with slightly yellowish tinge and somewhat lsmellar structure. Mergozzo (Novara). Val d'Ossola, Lepontine Alps. The marble from this locality was employed in huilding Milan cathedral, which is entirely made of white marble, from quarries belonging to the church itself.

3855. Blackish-white dolomite of large crystalline structure, and with rhomboidal fracture, associated with talcose and micaceous schists, as. also, with white marhle. Saore (Turin). Val d'Aosta, Pennine Alps.

3856. Feldepathic, younger gneiss, principally formed of very finely crystalline, grayish-white feldspar and a little quartz. The most celehrated gneiss in Italy. Luserne San Giovanni (Tnrin). Valle di Luserna, Cottian Alps. This gneiss owes its great importance to the circumstance of its heing very easily quarried in immense flags or slahe of comparatively little thickness, suitable for balconies, footpavements and many similar uses. It ie employed in Turin for such purposes, and is invaluable to the citizens, as it never forms mud or greasy slime in rainy weather, like the mejority of flagstones. Such heing its excellent properties, it is likewise sent to many of the great cities of northern Italy, and is even exported largely from Gsnoa to South America. The quarries are very numeroue, and the trade in the gneiss flourishing.

3857. Very fine-grained, greenish-gray younger gneiss, containing hluish-white feldspar and dark greenish mica in minote particlee, together with opeque-white quartz. Torre Pellice (Turin). Val Pellice, Cottian Alps.

3858. Younger gneiss, containing granular white feldspar, very uniformly distributed through the mass of the rock. Angrogna (Tnrin). Valle d'Angrogna, Cottian Alps. This is one of the most heautiful varieties of the Alpine gneiss, and very rare.

3859. Qnartzose younger gneiss, consisting of opaque-white quartz and silver-white muscovite. Beura (Novara). Val d'Ossola, Lepontine Alps. This rock dividee with great facility into large slabs or flags, which are much employed in the large cities of Lomhardy for halconies, etc. It is much softer to work than the very feldspathic gneiss of the Valle di Lnserna, but quite unsuitahle for paving.

3860. Younger gneiss, containing grayish-hrown mica and much opaque-white quartz, often forming small nodnlee in the rock. Sparone (Turin). Valle dell'Orco, Graian Alps.

3861. Very quartzose, grayish-white younger gneiss, containing small crystalline particles of feldspar, opaqne grayish-white quartz and grayish-green mica, also, occasionally, small crystals of hornhlende. Bergone di Susa (Turin). Val di Susa, Cottian Alps.

3862. Pale grayish-blue, banded, feldspatbio younger gneiss, of minnte crystalline structnre. Luserna San Giovanni (Turin). Valle di Lnserna, Cottian Alps. A splendid etone for publie works, for paving blocks or slahs. for parapets, copings of walls, hridges, etc. Quarried on an extensive scale.

3863. Yonnger gneiss with slight tinge of yellow, consisting of feldspar and quartz intimately associetcd. and minute scales of yellowish-green mica. Vayes (Turin). Val di Susa, Cottian Alps.

3864. Banded, gray, micaceous, younger gneiss, showing plainly the planee of stratification. Bobbio Pellice (Turin). Val Pellice (Waldensian valleys), Cottian Alps.

3865. Bluish-gray younger gneiss of finely orystalline structure, divides into immense slahs, along the planes of which are accumulated in large qnantities minute scales of muscovite. Luserna, San Giovanni (Turin). Valle di Luserna, Cottian Alps. A magnificent and ueeful etone for making balconiee aud flagetonee for foot pavemente in citiee, ae at Turin. Employed in all the large citiee of Piedmont, and likewise exported from Genoa to South America (eee sample No. 73).

3866. Iron-gray micaceons younger gneiss, Perrero (Turin). Valle della Germeguana, Cottian Alps (Waldensian valleys).

3867. Gray and yellowish quartzose micaschist. Angrogna (Tnrin). Valle d'Angrogna (Waldensian valleys), Cottian Alps.

3868. Grayish-yellow mica-echist, consisting principally of mnecovite of large lamellar structure, and with silvery reflex. Ricleretto (Turin). Valle San Martino (Waldeneian valleys), Cottian Alps.

3869. Gray mica-schiet, with brilliant silvery reflex. Angrogna (Turin). Valle d'Angrogna (Waldensian valleys), Cottian Alps.

3870 Iron-gray quartzose mica-schist, paeeing into younger gneiss. Angrogna (Turin). Valle d'Angrogna (Waldensien valleys), Cottian Alps.

3871. Pale yellowish-wbite mica-echist, containing minnte crystsle of garnet. Angrogna (Turin). Valle d'Angrogna, Cottian Alpe.

3872. Gray younger gneiss, containing large crystals of bluish-white feldspar, qnartz, often vitreous, and a small quantity of mica. Borgone di Susa (Tnrin). Val di Susa, Cottian Alps. A eplendid, very hard and durahle stone, admirably adapted for puhlic works. Quarried on a considerable scale for such purposes.

3873. Actinolite-schist, containing very minute crystals of actinolite. Valtournanche (Turin). Val Tournanche, Pennine Alps.

3874. Lead-gray micaceous calc-schist. Pont Canavese (Tnrin). Valle dell'Orco, Graian Alps. Quarried for making steps, etc., for architectural purposes. A good, durable stone, of agreeable appearance. It is associated with the crystalline marbles, which lie almost contiguous to it in conformahle stratification.

Crystallioe Rocks—St. Alban's System.

3875. Sienite, containing light puce-colored feldspar, in small cryetals, from the quarries of La Balma Quittengo (Nouvarn), Valle del Cervo, Pennine Alps. This is one of the most durable sienites in Italy. It is employed for paving hlocks, as in Turin, in some cases, especially for crossings of tramways. It is also a splendid ornamental stone for architectural purposes. Contains small crystale of puce-colored feldspar, quartz and hornhlende. Derived, according to Gasteldi, from recent gneiss. It is hy no means an eruptive rock.

Palœozoic Group—Carboniferous System

3876. Slate-hlue argillaceous echist, Conrmayenr (Turin), Val d'Aosta, Pennine Alps.

3877. Bluish-gray, compact limestone, with very irregular fracture; eo mnch eo, that it is impoesible to work it into any given shape, and traversed by veins of opaque-white calcite. Courmayeur (Turin), Val d'Aosta, Pennine Alps. Used for making lime.

3878. Anthracitic coal. La Thuile (Turin), Vallone della Balma, Graian Alps. This coal is from the coal hasin of the Monte Bianco. It is very scaly and conteins much fine dust. When properly washed it is an excellent fuel. Gives 5 830 calorific units, according to Berthier's process. There are eix hede, the principal one of which is 7½ ft. thick. Belongs, in all prohahility, to the horizon of the millstone grit of England and Ireland; that is to say, to the hase of the carboniferons system. See *Jervis I Tesori Sotteranei dell' Italia* (article, Le Thuila) and *I Combustibili Minerali dell' Italia*.

3879. White gypsum of almost compact structure. Forms heds in connection with carhoniferous, cavernous limestone. From the neighhorhood of the Monte Bianco, Courmayeur (Turin), Val d'Aosta, Pennine Alps.

3880. Compact white gypsnm, with colored veine. Courmayeur (Turin), Val d'Aosta, Pennine Alps.

3881. Anthracite coal. Demonte (Turin), Valle del Stuva, Maritime Alps. From the coal hasin of Demonte. Forms five heds, of which one is four ft. thick. From the base of the carhoniferons system, prohahly the equivalent of the millstone grit. Gives 6,239 calorific units. See Jervis' *I Tesori Sotteraner dell' Italia* (article Demonte) and *I Combustibili Minerali dell' Italia*.

3882. Stalactitical crystalline calcite. From the carboniferous limestone. Demonte (Cuneo). Valle della Stura, Maritime Alps.

3883. Massive white quartz, forming immense strata from 200 to 240 feet thick, extending from northwest to eontheaet for several miles in length, and entirely consisting of pure quartz, like this sample. Demonte (Cuneo). Valle della Stura, Maritime Alps.

Appen'ne Region.

N. B.—The Apuan Alps form part of the Appenines; the word Alp does not refer in the remotest manner to the Alpine chain, which is in quite another part of Italy.

3884. Prepalœozoic Group, indistinctly. Pale yellowish-green talcose schist. Cogoleto (Genoa). Riviera di Poriente.

3885. Pale yellowish-white felspathic rock, with talc in minute quantities. Cogoleto (Genoa). Riviera di Poriente.

3886. Pale green chlorite echist, inclosing the copper lode of the Frigido copper mine. Massa (Massa and Cerrara). Valle del Frigido, Apuan Alps.

3887. Asb-gray talcose felspathic rock, heautifully veined. Massa (Massa and Carrara). Valle del Frigido, Apuan Alps.

3888. Gray quartzoee echiet, from the proximity of the copper lode, Frigido copper mine. Meesa (Maesa and Carrara). Valle del Frigido, Apuan Alps.

3889. Siderite of epathose etructure, with a little quartz and chalcopyrites. Conetitute the gengue of the copper lode. Frigido copper mine. Maesa (Massa and Carrara). Valle del Frigido, Apuen Alps.

3890. Pale gray talcose echist, the rock inclosing the lead load. Bottino lead mine. Stazzema (Lucca). Valle del Vezze, Apuan Alpe.

3891. Yellowish-brown argillaceoue echist, from the lead mine of Bottino; the rock in proximity to the lode. Bottino mine. Stazzema (Lucca). Valle del Vezza, Apuan Alpe.

3892. Galena of small cryetalline etructure, from the lode in the talcose schist, associated with argillaceoue schiste. Bottino leed mine. Stazzema (Lucca). Valle del Vezza, Apnan Alps.

(To be Continued.)

A Good Man Gone.

There have been many expressions of respect to the worth of Dr. Hamilton in the newspaper press. The following, by W. C. Bartlett, who knew him well, is copied from the *Evening Bulletin:*

The sndden death of the Rev. Leurentine Hamilton, in his pulpit, in Oakland, Sonday April 9th, is announced with full particulars in our local columns. If the deceased conld have chossn the manner of hie death it probably would not have been different. He preferred to die with the "harness on," in the midst of his labors and in the hight of his usefulness. Since the death of Starr King, it ie doubtful if any other minister dropping out of the ranks could have been more missed from public life. Hie place was larger than his parish or the city where he had wrought so meny years. He was not a pulpit orator, like King, hut he was herdly less a man of the people. There were no hounds to his parish. He was a sort of hishop at large, or, in homely phrase, a town pnmp, to which all could resort. And they did so with great freedom. They called upon him for all eorte of services. The afflicted sought him as the friend and counsellor, the dying preferred that he should say the last words over them. He responded to all sorte of calls, and prohehly knew more about the distress, destitution and the eecret trouhles of individnale than any other man in the community. He had a quick and tender sympathy, and an inexhaustible patience. He was unselfish, with a fresh and almoet child nature—indeed, in the quality of hie natnre, he was a child on one side and a etrong man on the other. He was not worldly wise, knew little or nothing ahout the arts of making money, was not an organizer, and had no special capacity for executive work.

His honesty of speech, and thonght and life were elements of his strong character. He knew nothing about guile or deceit. He trusted others as he would he trusted himself. He abhorred even the color of hypocrisy, and declared his own convictions of truth, as he felt and saw it from time to time. He had little tact, but spoke as one who felt that he hed some message which ought then and there to he delivered, and must, on no account, he withheld. Lacking the graces of oratory, he did not always draw large congregations. His discourses were addressed to thinking men and women, and he eometimes preached over the heads of his congregation. A volume of his disconrsee was puhlished a few months ago, comprising such sermons as he delivered from his pnlpit on Snnday mornings, which, in the range of thought, power of etatement and elegance of diction, entitled him to a place in the front rank of religions thinkers. He refnsss to he hound by any creed of humen construction, and for that reason was often accused of being heterodox. Yet, in many respects, he was the most orthodox of religious teachers, but thinking on a higher plane, and with greater scope to his investigations than hie critice knew. He was once tried by his ministerial associates for technical heresy, but not hy hie "peers," since none who acted as his judges, were his intellectnal equals. A man with snch experiences could not he otherwise than tolerant, and he had at all times the large catholicity which made him willing to fraternizs with all good men who, in their several ways, were trying to make the world hetter by patient and usefnl lives.

It was hecause of this hreadth and catholicity, and thie "tenderness of heart," that so many knew him in what might be called a secular diocese, which at times seems as large as the State. He had been a pioneer and had eeen the rough side of life. He had devoted more than a quarter of a century to work in the mountains and in the valleys. He often eeid that he would like to he a preacher at large, going np and down the coast, ahle to sustain hie work without any drafts upon his congregation, and thonght, in euch a field, with the large freedom and the ignoring of all pecuniary henefits, he might do the best work of his life. The very lack of organizing ability, so foreign often to the scholar and thinker, gave him a singular fitness for this wider field. He was in no way dependent npon the mere accessories of chnrch organization; the heautiful temple and ite appointments never seemed so much to him as the opportunity to utter to thoughtful men and women the thonghts which had heen ripening in his own soul. If he could not raise his hearers to enthusiasm hy fervent oratory, he conld make them think, and that was largely his office as a religious teacher. He planted the seed, believing that eooner or later there would be a fruitful harvest.

It will be a long time before the exact measure of euch a man can be taken. He wae greater and hetter than the community knew. His work was multifarioue and epread ont over a large territory; and it was eo nnobtrusive that many who knew him, knew little of the extent and variety of hie lahors. This work wae the hest seal of hie apostolic commieion. He cared little for the criticisme of those who did not agree with his viewe and methods, though he had a keen sense of the fact that he was often mis-judged. He preferred that his life, his einglenese of purpoee, purity of heart and devotion to hnmanity at large, should furnish hie vindication. And so he wrought patiently through good and evil report—the echolar in his library, much given to hooks; the religioue philoeopher, not afraid of speculative inquiry, if it promised to lead to any important truth; the teacher, earnest and hrave, giving hie beet, and with a modesty which forbade any idea of pride; the missionary at large, subject to everybody's call for counsel, assistance and comfort; the large-hearted citizen, whose plans for doing good alwaye outran his meaus, but who found meny because he had access to many hearts; the friend whose fidelity wae never doubted, and the preacher whose example was as pure and noble as the words which came from his lips. When euch a man departs, the loss of the community cennot be expressed in any terms. It is not altogether a departure, because the beauty of his life and character remain. And so he "being dead, yet speaketh."

The Census and the Forests.

Many of our readere will remember the visit of Prof. C. S. Sargeut to this coaet last summer. He came as a special agent of the U. S. Census Office to obtain information concerning our forests. We recently received some advance proofs of parts of his report alluding to some of the Eestern States, and ere long the Pacific Coest Statss and Territories will no douht be described and forest maps made. The reports which Prof. Sergent has already issued show that great prodigality hae been characteristic of the treatment of forest areas in the United States.

The maps of Michigan, Wieconsin and Minnesota, for example, show with etartling distinctness how repidly the pine woods of the lake region are melting hsfore the ax, and the figures appended enable us to calculate with reesonable accuracy how long the devastation can continue. New Eogland hes squandered her pine, and so have New York and Pennsylvania, and now are drawing upon the final reserve.

In the three states named Professor Sargent estimatee that 82,000,000,000 feet (hoard measure) of merchantable pine remain stending, while the cut for the census year ending May 31, 1880, amounted to over 7,000,000,000 feet. It must he assumed thet the lnmber marketed every year will increeee as the country growe, so that it is safe to assert that when another census comes to be taken there will he no pine forest remaining—or at least none of snfficient extent to make any show on the map. The lake region has heen so thoroughly explored that there remains no chance of discovering any considerable hodies of timher which have not been included in the count. We know just what we have, we know that thie must soon he lost, and we know, too, that no provision hae heen made for any fnture supply. We know that the great hrown areas of Profesor Sargent's maps, which are so rapidly encroaching upon the forest green, represents territory upon which nothing is left but stumps. Small trees and great have been indiscriminately elaughtered. No young trees have been left to grow up to their full girth and stature. The lumher has heen sawed in the most extravagant way, as if the purpose had been to get rid of the forest as quickly as possihle. Timher has been squared in the woods, leaving the ground covered with dry chips and score blocks to feed the fires which have desolated whatever the ax and saw may heve chanced to leave, and burned out of the soil itself its capacity to support pine growth.

It is useless now to mourn over what has been done, although it is plain to see that the snpply of needed pine could have heen sustained indefinitely in growing forests if trees below a certain etandard size had hesn left. But we have forests of other timhsr treee in the Pacific States, of yellow pine in the Sonth, and herd wood in considerable quantities scettered all over the Union. The warning sounded by this report ought to awaken public eentiment and hring about some concerted action for checking this wanton waste of the national wealth. If ownere of woodland fnlly realizsd what their property would be worth a few years hence, lnmhsr would not be exported at a price which barely pays for the lahor of preparing it for market. The Government, too, might be induced to throw some restrictions about the sale of its timber land. And if private owners and Government officers were properly instructed, we might hope for the adoption of some conservative policy, under which our remaining forests could he preserved to yield a rich annual harvest for an indefinite period. It is plain that if our forests are swept away at the rate of millions of acres every year, the white pine is only one of our trees which will be practically exterminated. It should be remembered, too, that the direct pecuniary loss to the country is only one of the evils entailed hy thie destrnction.

The rneh to Butte city, Montana, and Wood River, Idaho, is eimply immenee. A Reno *Journal* reporter, who wae at Ogden the other night, reports the Utah & Northern train crowded, a large nnmher of the paesengere being compelled to remain etanding in the care, the company not having coachee enongh to accommodate the travel.

Huntington Mill.—We are glad to learn that the Huntington quertz mill, which hae heen, for the last two monthe, in the couree of erection on Groom creek, commenced crushiog ore yesterday, and promises to be henceforth a permanent sonrce of profit to its owners.—*Arizona Democrat.*

Tie-cutting on the Crow reservation in Montana Territory has been etopped hy the Government.

Mining in Sonora.

A correspondent of the Arizona *Star*, writing from Caborca, Sonora, says:

Admitting the vast mineral wealth of this section of the State of Sonora, yet, the existing order of things has a tendency to make the observer skeptical. Every Don, cad, proletaire you encounter, owns one or more mines, with a wealth-giving capacity, calculated, if we may believe the owners, to make millionaires of the multitude. Yet, is it not strange that out of this wealth of mines there is not more bullion produced? Between here and the Arizona line are situated three stamp mills. One, of ten stamps, at Oposon, hung up for the past six months, and the most sanguine of its managers does not expect to hear its whistle blow for three months more; another of 20 stamps at Juarez, working an average of about four hours per day; still another here at Caborca possessing 20 stamps that have not made a noise for five months, and God only knows when they will. This is the hard, practical part of the business stripped of the garniture of honied words and extravagant assertions. If these ore reduction machines are all idle through accident, does it not seem a remarkable coincidence? Still I believe that

Sonora Possesses Untold Mineral Wealth

If the fates would allow its development. These fates are many and varied, some natural, others artificial. The natural fates against the development of Sonora are its barren, sterile soil and great lack of water. From Arizona to Caborca, 114 miles, there is not a bit of vegetation to be seen, and here only a narrow valley barely able to produce sufficient to supply the wants of its own immediate inhabitants. Thus it becomes necessary to haul the necessaries of life a long distance, entailing an immense expense and vast labor, well calculated to discourage most men from encountering it. Then again, water is very scarce. By sinking deep enough, water sufficient to defray the cravings of nature can be found, and by a judicious system of dams and reservoirs, the waterfall of the rainy season can be secured in sufficient quantities to provide for the wants of cattle, and in some places enough for the use of an ordinary mill. Admitting all these difficulties interposed by nature to be overcome, then perhaps

The Real Difficulty Begins.

Mexicans would like to see foreigners invest money in the development of their country's resources, but would like to retain the prerogative of having it invested under Mexican auspices and management. Few Americans, I opine, would be willing to risk their money under such conditions. Such is the real state of affairs here. That the irregular mountain chains and gulches are the homes of vast deposits of the precious metals, there is hardly a reasonable doubt, and that modern machinery and mechanical genius can overcome the obstacles of nature, in converting the mineral-bearing rock into bullion, I believe. But whether the investor can overcome the artificial obstacles with profit and honor to himself, others than the present writer must determine. Caborca is at present about as peaceful, quiet and tranquil a town as could be easily scared up on the American continent. The women are busy going to church, and the men are busy swapping lies. Business is not visible in any shape or form, and how the people subsist, would puzzle a conjuror. Nobody is working, nobody is hurrying; everything seems stagnant and depressed. A half a year ago this was a pretty lively town; the shrill scream of the steam whistle resounded through the valleys and gulches, and the thundering of the quartz stamps could be heard at all hours of the day or night. Here, too, it may be observed, there is no lack of water. In fact, for mining and milling purposes, it seems to be the garden spot of Sonora.

The Santa Felicita mine is now about 175 ft. deep and is being worked steadily, the superintendent hoping to have the shaft 280 ft. deep in three months, at which time it is expected to tap the shaft with a tunnel that is being driven into the bowels of the mine at present.

Men Wanted.—Workingmen are now scarce in this part of Arizona. Men are wanted to work on the railroad, in the mines, on farms, ranches, almost everywhere. We suppose that 300 men could find good paying work in Yavapai and Mohave counties. No nonsense about this; it is a fact, and a very healthy one at that. It shows that northern Arizona is progressing; that public works are being constructed, and that the industries of the section are being developed. There have been, in our history, times when we could not say so, truthfully. But we do not now hesitate to say so.—*Prescott Courier.*

Good News from Cambridge.—H. G. Blasdel, Jr., came up from Cambridge the other day, and reports a rich strike in the Blasdel mine there. The 10 stamp mill has just turned out about $3,000 in bullion from the mine. We are glad to hear that Col. Blasdel is about to be fully rewarded for the amount of work and capital he has put into Cambridge—*Esmeralda Herald.*

Good Showing.—The Ludwig copper furnace shipped 72 tons of copper as the result of their run in March. The Ludwig mine is situated on the range of mountains dividing Smith and Mason valleys, in Esmeralda county, and has an abundance of ore to keep the furnace fires burning steadily for years to come.—*Esmeralda Herald.*

Useful Information.

Where Buttons Come From.

The button trade of New York is estimated at from $8,000,000 to $10,000,000 a year. Last year the importation of buttons exceeded $3,500,000, the aggregate for the four years just passed being but a little short of $13,000,000. At American rates of wages many of the imported buttons could not be put upon their cards for the price they sell for.

Glass buttons are made mostly in Bohemia, and children are largely employed at the work, which they do as quickly and as neatly as adults. The children get 10 cents a day, men get from 40 cents to 50 cents, and women a little less. Pearl buttons are imported from Vienna, where they are almost exclusively manufactured; and the all-important shirt buttons are received mostly from Birmingham, England, where the majority of metal buttons are likewise procured. The most extensive of all the button manufacturing, however, is that of the Parisian and Berlin novelties. In one manufacturing village near Paris, where there are from 5,000 to 6,000 inhabitants, all the working people are engaged in making the agate button, which, even with 30 % duty added to the cost, sell, when imported into this country, at the extremely low figure of 31 cents per great gross. The material alone, it is reported, could not be procured here for double that amount.

While American manufacturers make no attempt, and probably have no desire, to compete with European producers employing band processes, they excel in making bone, composition, brass, ivory and gold buttons by machinery, and are able to export considerable quantities of these styles. In Providence, R. I., for example, sleeve buttons and jewelery buttons are largely manufactured expressly for exportation.

Floating Soap.—Messrs. Proctor & Gamble, of Cincinnati, have devised a floating soap, which will not sink in the water. When a piece of this soap is dropped into a tub of water, it goes under, but immediately bobs up again and floats upon the surface. The advantage of this soap to millmen and mechanics, who, in washing, make the water very dirty, is manifest, for no time is lost in fishing around the bottom of the tub for the soap, as it floats on the top of the water like a white chip. The soap is called "ivory," presumably on account of being of a creamy white color like ivory. French soap makers have from time to time made soaps that will float, but they lacked durability and strength sufficient to stand rough usage. The prime requisite for a floating soap is that it shall be made of oils, for oil may be converted into soap that will float as well as oil in its natural form, if the soap be free from adulteration. In fact, it must be a thoroughly clean, pure article. Such a soap will make a soft, creamy lather, easily rinsed off, not greasy or gummy, as is too often the case.

New Dyeing Material.—A beautiful golden-yellow dye is now prepared from the young wood of various poplars. The young branches and shoots are cut off, crushed and brayed, and then boiled in alum water in the proportion of 10 lbs. of wood and one pound of powdered alum to three gallons of water. The liquor is boiled from twenty minutes to half an hour, and then filtered. In cooling it thickens and clears, throwing down a greenish-yellow deposit of resinous matter. When sufficiently clear the liquor is again filtered, then left exposed to the air for three or more days, according to the weather and the atmosphere. It quickly oxidizes under the action of light and air, and assumes a rich golden tint, and in this state can be used for dyeing fabrics of all descriptions. For yellow and orange-yellow shades it is used alone; mixed with Prussian blue it gives green; with oak bark, brown and tan; with cochineal, etc., orange and scarlet shades. The coloring thus produced is said to be of superior quality.

Removal of Grease Spots.—Whenever oil of turpentine, benzole or ether is used to remove grease spots on cloth, the application should be made on the reverse side of the cloth, by moistening it with the solvent in a circle surrounding the spot, so as to approach it gradually, having blotting-paper in contact with the spot of grease, to absorb the fat immediately; otherwise the solvent will have the effect of spreading the grease over a larger surface instead of driving it out of the cloth. In the application of a hot iron to one side and blotting-paper to the other, the heat will drive the grease out of the cloth into the paper, because the fat has a tendency to move from the hotter parts toward the cooler.

The First Line of Telegraph was erected less than 40 years ago, and at the present time there are more than 100,000 miles in operation. The United States comes first, with 250,000 miles, with the immediate probability of adding another 100,000 miles; Germany comes next, with 150,000 miles, and the great Chinese empire last, with 1,200 miles.

Steel may be "blued" by heating it evenly in an ash bath—that is, a quantity of sand is spread over a sheet of boiler iron and heated up to about the boiling point of oil, say 600°. If a little oil is rubbed over the surfaces with a piece of waste, the color will be better. All articles to be colored should be polished.

Brightening Iron.—A Bavarian serial contains a method of brightening iron recommended by Boden. The articles to be brightened are, when taken from the forge or the rolls, in the case of such articles as plates, wire, etc., placed in dilute sulphuric acid (1 to 20), cleansing the articles, which are then washed clean with water and dried with sawdust. They are then dipped for a second or so in nitrous acid, washed carefully, dried in sawdust and rubbed clean. It is said that iron goods thus treated acquire a bright surface, having a white glaze without undergoing any of the usual polishing operations. This is a process that those interested can easily test for themselves. Boden states that the action of the sulphuric acid is increased by the addition of a little carbolic acid, but it is difficult to see what effect this can have, and it may very well be dispensed with.

How to Cleanse Mica.—Every woman who has been obliged to spend half a day several times during the winter cleaning plates of mica in her coal stove, usually by taking them out and washing them in soap suds, will rejoice to know that there is no need to take them out or let the fire burn very low in order to do it successfully. Take a little vinegar and water and wash the mica carefully with a soft cloth; the acid removes all stains, and if a little pains is taken to clear the corners thoroughly and wipe them dry, the mica will look as good as new. If the stove is very hot, tie the cloth to a stick, and so escape the danger of burning the hands.

The Modern Hat.—Bayard Taylor says: "It is a withering commentary upon our modern costume that no sculptor has dared, or ever will dare to model a statue wearing a stovepipe hat."

Good Health.

A Dangerous Curiosity.

It is the most natural thing in the world, when you have gone to bed, to get up, run to the window, hoist it and look out at an alarm of fire or any unusual noise or clamor going on outside. A lady was roused from her sleep by a cry of "fire;" her chamber was as bright almost as day when she opened her eyes. She went to the window, and soon saw that it was her husband's cotton factory. She felt on the instant a shock at the pit of the stomach; the result was a painful disease which troubled her for the remainder of her life, a period of nearly 15 years.

A young lady just budding into womanhood was called by the sound of midnight music to the window, and in her undress leaned her arm on the cold sill; the next day she had an attack of inflammation of the lungs which nearly killed her. She eventually recovered, only to be the victim of a life-long asthma, the horrible suffering from the oft-repeated attacks of which, during now these 20 years, is the painful penalty, to be paid over and over again as long as life lasts.

A letter just received from a successful banker, who has been an invalid for five years, every now and then spitting blood by the pint, with a harassing cough which makes every night and morning a purgatory, states that the immediate cause of all his sufferings, and the final blasting of life's prospects, was his getting up on a cool night, to look out of his chamber-window, his body being in a perspiration at the time. That sturdy old Trojan, Dr. Johnson, used to say that "mankind did not so much require instructing as reminding;" hence the present reminder, that it is dangerous for people to be poking their nightcaps out of windows after night-fall. Another mischievous habit in the same direction, may have pertinent mention here: Standing in the street doorway in cold weather, while the door itself is open, in taking leave of visitors. The cold air from without rushes into the dwelling, causing a draft, which chills the whole body almost instantly. It is a hundred times safer to close the door and stand without, bare-headed. Many a tedious case of sickness and suffering has been occasioned, and even life itself has been lost, by an exposure, apparently so trifling. May our readers remember these things, and teach them to their children on the instant.

Medical Virtues of Celery.—An English writer proclaims cooked celery as a cure for rheumatism, which it certainly will not harm if it fails to cure. We read as follows: "Celery, cooked, is a very fine dish, both as nutriment and a purifier of the blood. I will not enumerate the marvelous cures I have made with celery for fear the medical men should, like the corn dealers, attempt to worry me. Let me fearlessly say that rheumatism is impossible on such a diet. Plainly let me say, cold or damp never produces rheumatism, but simply develops it. The acid blood is the primary cause and the sustaining power of the evil. While the blood is alkaline there can be no rheumatism, and equally no gout. I must return to cooked celery. Cut the celery into inch pieces, and boil in water until soft. No water must be poured away unless drank by the invalid. Then take new milk, slightly thicken with flour and flavor with nutmeg; warm with the celery in the saucepan; serve up with diamonds of toasted bread around the dish, and eat with potatoes."

Diphtheria.

Dr. Franklin Staples, of Winona, Minn., after an extended correspondence with physicians in most of the counties of his State, has published a report on diphtheria, in which he classes the disease as contagious and infectious, and demonstrates that it is on the increase, a fact due, in his opinion, to failure on the part of physicians in recognizing its self-propagating properties; to want of systematic nursing of patients suffering with the disease; to incomplete disinfection of premises attacked; and last, but not least, to the frequent intercourse of convalescents with healthy persons. He maintains that strict regulations, rigidly enforced, are the only means adequate to cut short its career, and since individual power is unable to cope with it, urges that every city and town should devise efficient sanitary laws, and let them be enforced by intelligent medical officers, who shall also make it their duty to instruct the people in sanitary rules. To guard against the contamination, he believes that filth, whether from dirty rooms, soiled clothing, defective drains and cesspools, ill-ventilated rooms, poisonous inodorous gases, etc., should be regarded as conditions which invite the disease; that the apartment set apart for the patient should be divested of all furniture, carpets, curtains and fabrics of any kind not absolutely required; that discharges from the nose, mouth, and bowels should be carefully collected and destroyed, and that all personal clothing, bed linen, etc., should be thoroughly disinfected before being sent to the general wash. In case of death, all clothing and unimportant articles should be burnt, the body should be immediately disinfected and put into its coffin, which should be kept permanently closed. There should be no public funeral. He prefers disinfection by chlorine gas, which is to be set free in the room. Ventilation for a number of hours should then be insisted upon. Precautions falling short of these Dr. Staples considers to be useless in preventing the spread of the infection—*Report on Diphtheria to the Minnesota Board of Health, 1881.*

Malarial Germs.—M. A. Laveran has found, in the blood of patients suffering from malarial poisoning, parasitic organisms, very definite in form and most remarkable in character; motionless, cylindrical curved bodies, transparent and of delicate outlines, curved at the extremities, transparent spherical forms provided with fine filaments in rapid movement, which he believes to be animalcules; and spherical or irregular bodies, which appeared to be "cadaveric" stage of these, all marked with pigment granules. He has also detected peculiar conditions in the blood itself. During the year that has passed since he first discovered these elements, M. Laveran has examined the blood in 192 patients affected with various symptoms of malarial disease, and has found the organisms in 180 of them, and he has convinced himself by numerous and repeated observations that they are not found in the blood of persons suffering from diseases that are not of malarial origin. In general, the parasitic bodies were found in the blood only at certain times, a little before and at the moment of the accession of the fever; and they rapidly disappeared under the influence of a quinine treatment. The addition of a minute quantity of a dilute solution of sulphate of quinine to a drop of blood sufficed to destroy the organisms. M. Laveran believes that the absence of the organisms in most of the cases (only 12 in the whole 192) in which he failed to find them was due to the patients' having undergone a course of treatment with quinine.

Astounding Effects of Tobacco.—A veteran user of the weed in this city was recently taken sick and confined to the house. A physician was summoned and pronounced his complaint disease of the heart. He ordered the patient to be deprived entirely of tobacco, and said he would be able in a few days to tell what the man's chances of recovery were. The tobacco was stopped, and then followed a season of derangement and visions, less intense and terrorizing than those belonging to the alcoholic frenzy, but annoying and remarkable to the patient. He saw black flies in myriads on the walls of his room; then thousands of fire-flies, such as are seen in June. These were followed by millions of little golden, metallic-hued beetles. He sat beside a lovely stream of water that wasn't there, and gazed into its limpid depths. He saw crowns, queer garments covered with the heads of nails, all sorts of armor, and bric-a-brac enough to furnish every house in the State. During the whole day the atmosphere was so yellow that he could not see the neighboring residences; another day cloudy veils shut out from his view for brief intervals the objects about him. His experience, while it has satisfied him that tobacco affects the brain, has not destroyed his love for the weed, which he constantly desires, but is debarred from using because of his condition. The patient is out, and, we are glad to say, is doing well—*Norwich, Conn., Bulletin.*

Trustworthy merchants from Moscow, state that eighty workmen employed on the Usapanski cathedral, were arrested Holy Thursday in consequence of the discovery of a mine under that edifice, in which the intended ceremony of the coronation of the Czar was to take place.

Antimony is selling in London for £53 to £54 per ton for French Star regulus.

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SAN FRANCISCO:

Saturday Morning, April 29, 1882.

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Passing Events.

The rapid disappearance of the enow in the mountainous regione which ie now going on will, within the next few weeke, give an opportunity for the hundrede of men now waiting to again begin their search for hidden mineral. Prohably never before has eo large au army of proepectore advanced as thie year. The etride which the mining intereet hae taken in public estimation within the past two or three yeare, hae much to do witb thie; aud the fact that there are yet exteneive regione favorahle to prospecting has induced many to turn their attention to thie fascinating employment.

The rueh to Wood River ie now eo great that paeeengere hy the etagee from Blackfoot and Kelton are regietered eeveral daye ahead. No doubt many will he dieappointed, hut the region muet he well proepected where euch numbere of men work it over.

The committee appointed to present a plan for draining the flooded Comstock minee, have, as is etated elsewhere, agreed upon a plan. The officere and leading men of the eeveral mines are now heing conenlted. Some action will very ehortly he taken, ae it is hardly prohable that they will leave all the minee, or nearly a mile of the Cometock lode, flooded with water for any length of time, unlees they mean to entirely ahandon the lower levels.

The Indian outhreak in Arizona will he very injurious to that Territory, ae it will deter many from going there. Proepectore will prefer going to Idaho and Montana, as long as there is fear of Indiane.

A LOT of shoemakere who paseed through here from the Eaet for California, a few weeke ago, eaye the Elko *Independent* of Wednesday, returned on their route yeeterday, by the emigrant train. In convereation with citizene they etated that white artieans in their line had no hueinese in California, the Chinese having completely monopolized that trade.

Production of the Precious Metals.—No. 6,

[An abstract of the Census Monograph on the Bullion output of the country.]

IDAHO.

The tabulation of the output of thie Territory ia haeed upon reporte of the examining expert, Mr. Albert Williame, Jr., on 369 deep minee, 14 placer minee, 18 amalgamating mille, 2 arastras, and 2 smelting worke, heeidee eeveral general reporte on whole districte.

From 1876 up to the close of the censue year, the product of thie Territory hae heen mainly dependent upon the older mining districts, of which the placer minee of Boise hasin, have contributed a large proportion. The panic in the stock market of San Francisco in 1876, led to a euepension of operatione in the principal Owyhee mines, which for eome yeare previone to that period had yielded large returne. This crash wae due quite as much to miemanagement of the minee themeelvee, ae to canses inherent in the speculative market; bnt whatever the reaeon, the result wae the cloeing down of many minee which prohahly would have been etill largely productive if properly worked. Ae the case now etande, the Owyhee district, which formerly yielded hy far the greater part of the total output of the Territory, at preeent furniehee only about one-fifth of the aggregate. It ie to he hoped that at no dietant time in the future, this dietrict may again appear as a large producing center.

Had theee etatietice heen collected for a year ending only a few monthe later, the new Wood River country would have added largely to the total product. Operations in thie dietrict were only eeriouely hegun toward the cloee of May, 1880; hence the large product of ores shipped to Salt Lake during the fall of the eame year, doee not enter into the tahnlation for the ceneue year. In addition to the developments in the Wood River country, a number of other new localitiee appear ae future important productive eources, prominent among which ie the Sawtooth dietrict, which from the aheence of local milling facilitiee wae at a etandstill, pending the erection of reduction worke. Another year will witneee a coneiderahle hullion production from the minee of thie district. The same remark holde good with regard to Smiley's canyon, from which a emall amount of ore wae ehipped at great expenee to dietant pointe for reduction. The returne from theee shipmente were euch ae to give great hope for a large increase when it hecomee poeeihle to treat the oree at a greater advantage, in mille placed near the minee.

In the Yankeo Fork region a decided improvement in the eituation ie to be noted. Here the Bay Horee, and Kinnikinnick, will also add largely to the total product.

The period covered hy the ceneue year, while one of great promiee for the future of the Territory, nevertheleee ehowed a comparatively emall yield. The prohabilities are, that within two years the ontput of Idaho will at least have donhled.

The deposits of Idabo hullion (ao far ae it ie poseihle to eegregate them, a very large portion having passed through private refineriee and thus loeing their identity) up to the cloee of the fiecal year ending June 30, 1880, are atated hy the Director of the Mint, to have heen $24,137,417 gold, $727,296 eilver, and $24,864,713 total. Thie amount is far leee than the actual output up to that date, vague unofficial estimatee placing the total yield ae high ae $60,000,000.

Of the gold product for the censue year, 59,42 % ie from placers, and 40.58 % from the deep minee. Idaho furnishee 7.32 % of the placer output of the United Statee, 2.81 % of the deep mine gold, and 4.43 % of the total gold; 1.13 % of the silver, and 2.60 % of the entire product of the precioue metale in the whole country. Ae a gold producer, the territory ranke eixth, and in silver, seventh. The average yield per square mile ie $17.45 gold, $5.30 eilver, and $22.75 total. In thie reepeot Idaho etands fifth in point of gold, eeventh in eilver, and eixth in developed richnese in gold and silver. The average yield per capita ie $45.38 gold, $13.78 eilver, and $59.16 in hoth precious metale, placing the rank ae regarde product in reference to population third ae to gold, eixth ae to eilver, and fifth altogether. The comparison with regard to population is prohahly the moet reliable teet of the relative prosperity of a mining region.

IDAHO—Production of Deep Mines for the Year Ending May 31, 1880.

COUNTY.	Ore raised during census year.	Average assay value per ton. Gold.	Silver.	Gold and Silver.	Total assay value of ore raised during census year. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Alturas	4,077.75	36.43	46.12	82.55	148,536	188,088	336,624
Boise	16,605.00	16.92	6.51	23.43	281,020	108,195	389,215
Idaho	*500.00	*25.00	.....	*25.00	*12,500	.....	*12,500
Lemhi	5,000.00	60.00	60.00	120.00	300,000	300,000	600,000
Nez Perces	300.00	20.00	.....	20.00	6,000	.....	6,000
Oneida	500.00	25.00	.....	25.00	12,500	.....	12,500
Owyhee	8,342.75	32.35	33.81	66.16	269,927	282,097	552,024
Washington	500.00	15.00	.....	15.00	7,500	.....	7,500
Total	35,825.50	28.97	24.52	53.49	1,037,983	878,380	1,916,363

COUNTY.	Ore raised and treated.	Average yield per ton. Gold.	Silver.	Gold and silver.	Bullion produced from ore raised and treated during census year. Gold.	Silver.	Totals.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Alturas	908.00	53.13	65.45	118.58	48,242	59,436	107,678
Boise	15,645.00	13.44	5.39	18.83	210,231	84,465	294,696
Idaho	*500.00	*20.00	.....	*20.00	*10,000	.....	*10,000
Lemhi	2,500.00	50.00	50.00	100.00	125,000	125,000	250,000
Nez Perces	*300.00	*15.00	.....	*15.00	*4,500	.....	*4,500
Oneida	500.00	20.00	.....	20.00	10,000	.....	10,000
Owyhee	7,176.75	25.09	24.68	49.77	180,101	177,109	257,210
Washington	500.00	10.00	.....	10.00	5,000	.....	5,000
Total	28,029.75	21.16	15 91	37.07	593,074	446,010	1,039,084

COUNTY.	Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year. Gold.	Silver.	Total.	Bullion produced during census year from ore previously raised. Gold.	Silver.	Total.
	Tons.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.
Alturas	3,169.75	90,887	123,670	214,557	3,500	3,500	7,000
Boise	950.00	38,595	17,310	55,905	3,436	.....	3,436
Lemhi	2,500.00	150,000	150,000	300,000	.....	.....	.....
Owyhee	1,166.00	59,776	75,715	135,491	.....	.....	.....
Total	7,795.75	339,258	366,695	705,953	6,936	3,500	10,436

*Estimated.

OREGON—Production of Deep Minee for the Year Ending May 31, 1880.

COUNTY.	Ore raised during census year.	Average assay value per ton. Gold.	Silver.	Gold and Silver.	Total assay value of ore raised during census year. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Baker	12,737	11.00	1.59	12.59	140,091	20,316	160,407
Orant	1,200	76.87	45.88	122.75	92,240	55,050	147,290
Josephine	150	*34.83	.....	*34.83	*5,225	.....	*5,225
Total	14,087	16.86	5.36	22.21	237 656	75,366	312 922

COUNTY.	Ore raised and treated.	Average yield per ton. Gold.	Silver.	Gold and Silver.	Bullion produced from ore raised and treated during census year. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Baker	12,007	7.80	.34	8.14	93,305	4,307	102,012
Orant	1,015	67.21	13.43	80.64	68,221	13,639	81,800
Josephine	150	31.66	.....	31.66	4,750	.....	4,750
Total	13,772	12.44	1.30	13.74	171 276	17,946	189,222

COUNTY.	Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year. Gold.	Silver.	Total.	Bullion produced during censur year from ore previously raised. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Baker	130	3,900	3,900	7,800	88	1,661	1,749
Grant	185	18,500	37,000	55,500	.....	.....	.....
Total	315	22,400	40,900	63,300	88	1 661	1,749

*Estimated.

IDAHO—Production of Placer Minee for the Year Ending May 31, 1880.

County.	Gold.
Ada	$ 5 000
Alturas	35,000
Boise	622,645
Cassia	20,000
Idaho	00,000
Lemhi	20 000
Nez Perces	10 000
Oneida	30,000
Owyhee	52,000
Shoshone	10,000
Washington	15,000
Total	$879,645

OREGON.

Oregon ie one of the oldeet of the Weeteru mining States, the diecovery of gold within ite limite having followed closely upon that in California. Ite output hae never heen very large in oompariaon with the yield of ite neighhor State, hut although the minee have become eecondary to ite agricultural reeources in point of importauce, they etill furnieh occupation and profit to many of ite inhabitante. The quartz veine of Baker county, in the eastern portion of the State, adjoining Idaho Territory, continue to yield the larger portion of the total deep-mine product of thie State. The prevailing type of the Oregon oree is a free gold quartz, though rehellioue gold ores requiring epecial treatment are found in eome localitiee, and a emall amount of eilver ie produced in Grant county.

The latter county takes the lead in eurface mining, while Baker, Jackson and Josephine countiee are aleo productive of a coneiderahle amount of placer gold.

Oregon now ranks seventh on the roll of the mining Statee in production of gold, eleventh in outpnt of eilver, and ninth in ite yield of hoth metale. Ite quota toward the total production of the United Statee ie 7.75% of the placer gold, .80% of the deep-mine gold, 3 29% of the total gold, and only .07% of the total eilver. The percentage of the total combined gold and eilver product ie 1.49%. The average yield per equare mile is $11.43 gold, $0.20 eilver and $11.63 total. The product per capita ie $6.28 gold, $0.11 silver, and $6 39 total, giving Oregon a rank of seventh in gold, tenth in eilver and ninth in total hullion output, in point of production, ae relative to population. The small proportion per capita ehows how complcteiy mining has heen overshadowed hy other induetriee in thie State.

OREGON—Production of Placer Minee for the Year Ending May 31, 1880.

County.	Gold.
Baker	$150,136
Coos	75
Curry	9,375
Douglas	12,826
Orant	291 400
Jackson	188 790
Josephine	190,454
Umatilla	76,030
Wasco	1,200
Total	$926,336

WASHINGTON.

Of the small product reported from the deep minee of Washington Territory, nearly the whole comee from Peshaeton district, in Yakima county, where gold qnartz mining ie conducted on a emall ecale.

The upper Columbia placere furuish over one-half of the total placer yield of the Territory. The Skagit mines, in Whatcom county, ahout which, from time to time, reporte glitteiing with golden promise bave heen epread, are not yet to he nnmhered among the important productive depoeite of the country. They have attracted much attention from the prese, and have been the ecene of several incipient "rnehee," hut the ehortneee of the eeaeon, inacceeeibility, and other natural dieadvantagee

have combined to retard operations, and the yield is still very scanty.

WASHINGTON—Production of Deep Mines for the Year Ending May 31, 1880.

County.	Ore raised during census year.	Average assay value per ton. Gold.	Silver.	Gold and silver.	Total assay value of ore raised during year. Gold.	Total.
	Tons	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.
Yakima	437	*41.85	Trace.	*41.85	18 287	*18,287
Scattered	100	37.50	Trace.	37.50	3,750	3,750
Total	537	41.04	Trace.	41 04	22,037	22 037

County	Ore raised and treated	Average yield per ton. Gold	Silver.	Gold and silver.	Bullion produced from ore raised and treated during census year. Gold.	Total.
	Tons	Dolls	Dolls.	Dolls.	Dollars	Dollars.
Yakima	437	31 59	Trace	31.59	13,800	13.800
Scattered	100	30 00	Trace	30.00	3,000	3,000
Total	537	31.28	Trace	31.28	16,800	16,800

*Estimated.

WASHINGTON—Production of Placer Mines for the Year Ending May 31, 1880.

Locality.	Gold.
Whatcom county, Skagit mines	$ 4,000
Yakima county, Swauk mines	10,000
Upper Columbia placers	60,000
All other placers	45,000
Total	$119,000

ALASKA.

This vast Territory, ooonpying an area of over half a million square miles, is for the most part still an unexplored region. The small amount of prospecting whioh has been done, has developed the faot that Alaska contains many gold-bearing localities, none of which, however, have yet yielded any considerable ontput. The climate and remotsness from oommunications, will always be obstaoles in the way of mining; but in spite of the natural disadvantagea of the conntry, it is reasonable to look for an increased product in the future. Recent reports, mnch exaggerated, of fabulona discoveries of mountains of silver ore, have attracted many adventurous miners to Alaska. Thus far only disappointment has resnlted. The Takou gold district, which has been explorsd to some extent, is, however, stated to have yielded $150,000 in the season of 1881.

The amall amonnt of placer gold received at the San Francisco mint from Alaska during the censns year, $5,951, does not perhaps represent the whole product for that period, as a portion may have found its way to Victoria, and thus have become identified with the prodnct of British Columbia. No means of tracing this small possible balance are at hand. The total was in any event insignificant.

Adjustable Rock Drill Rest.

Wm. T. Browne, of Stockton, has just received, through the MINING AND SCIENTIFIC PRESS Patent Agency, a patent covering a new form of adjustable rest or support for machine rock drills.

It consists in a tripod snrmounted by a bearing block swiveled thereto, the block having a notch or slot with a friction roller, in which is fitted a strap or rod secured to the under side of the frame of the rock drill, thus affording a support or rest for the drill, and allowing it to be moved forward, while by the swiveling or turning of the block, it may be directed or adjusted in any desired position.

The devise may be adapted to almost any form of machine rock drill whether operated by ateam or by hand, but is more particularly designed to be applied to hand rock drills.

These hand rock drills, on account of their lightness, are frequently intended to be supported by the operator, and, in some cases, are desigoed to be supported from the shonldera by suitable straps, and the recoil resisted by the body. By this means, the drill may be operatsd in various directions. The difficulty of providing a suitahle rest or support for these machines has been because of the necessity of advancing the drill as it works forward, and of drilling in various directions. To stop each time and regulate or adjust the support would be too inconvenient. A two-legged device has been used, the principle of which has been to advance by leaning forward, its base remaining stationary, while its upper end describes the arc of a circle. It is obvious that this ia objectionable because of changing the inclination of the drill, while the hole in which it works remains the same, so that it must necessarily cramp or bind.

With the improved device, when the drill is in operation, the whole frame may be advanced, the strap traveling on the roller and being supported thereby. Its lateral inclination may be changed readily hecause of the awiveling hearing-block, while its vertical inclination may be varied by elevating or depressing its end. Its vertical position is adjusted by means of the extensible legs or props. The rest or support remains level all the time, and the drill frame is kept horizontal, so that it will not cramp.

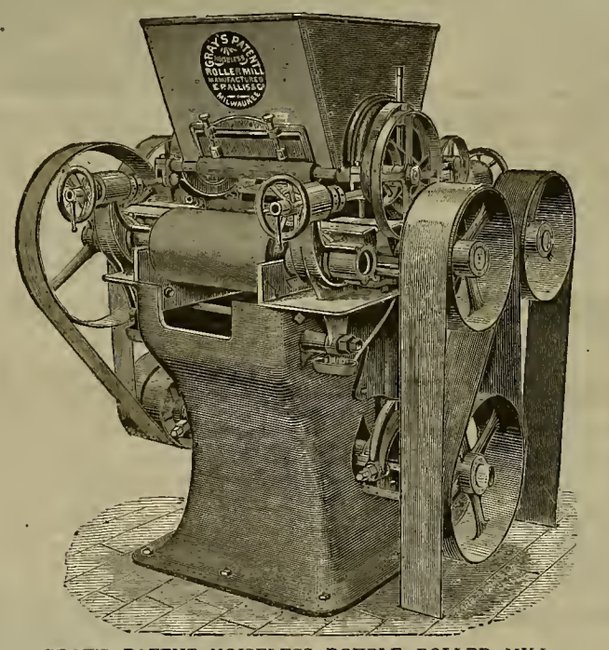
A New Sun Engine.

Attempts have been made from time immemorial to convert the heat of the sun into a substitute for fuel, with varying results. Archimedes (who burned the Roman fleet which waa blockading Syracuse, by a system of mirrors), Euclid, Hero, De Cans, Buffon, Ericsson, Muchot and others, bave made experiments in tho directiou of utilizing the heat rays of the sun as a motor for industrial purposes; but all of the devices heretofore usad, which have come under our observatiou, have been made after the same plan—*i. e.*, the reflectors are in the shape of inverted conss, or pyramids, or parabolic surfacsa of revolution, with the boiler placsd vertically in the axis of the reflector. Such constructions allow or permit only short and narrow surfaces of reflection, and the heat rays are thrown upon the boiler in concentric rings, or spots, a process quite limited in its practical application. No difficulty has heen experienced in collecting and concentrating aufficient heat rays to generate steam, and a pressnre of 7 to 9 atmospherss has been reached in from 30 to 60 minutes, giving from 1 to 3 H. P., and the well-known French enginser, Muchot, has succeeded in pumping water and performing other light work with an apparatus constructed on this plan, by solar force alone. But it is quite impossible to secure large and unintermittent power from devicea of the form described above, which are necessarily small, for obvioua reasons.

Gen. George W. Deitzler, of San Francisco, Cal., has just patented, through the Patent Agency of the MINING AND SCIENTIFIC PRESS, an improvement in solar reflectors and heat receivers, which promises very important results. This inventor has departed from the old style, and has adopted a reflector of parabolic section, which is placed horizontally, the lines of the reflecting surfaces being parallel to the axis of the boiler, which form of constrnction enables him to expose to the sun long and broad surfaces of reflection, within workable limits, and heat tubes, or boilers of great length, the heat-rays being concentrated in long lines on the whole of the under line of the boiler, with great evenness, each section exposed receiving the same amount of heat, the action being very much like the flame of the furnace of the ordinary steam boiler. As there is no limit to the size of this reflector, there is none to the amount and intensity of the heat that can be produced, and consequently no limit to the force of the steam that can be generated. The cost of the reflecting surface and of the boiler is quite reasonable, and there is no-mechanical difficulty in the construction and operation of this apparatns. The steam generated in the boiler is led by pipes to where it may be needed in the usual way. The apparatus is mounted and provided with special mechanism whereby the orientation, or setting to the east, of the apparatus ia made to move with the apparent course of the snn, automatically, or otherwise. The inventor furnishes us the following additional information on this subject:

A small working machine of this description has been constructed, and givea admirable results, producing steam in 20 minutes, the water boiling violently in 30 minutes. There are many other purposes to which it can be applied besides driving steam machinery, snch as roasting ores, distilling and rectifying spirits, etc., but it will he found particularly useful in our dry and hot valleys for pumping water, thrashing grain, etc. There are millions of acres of the finest land in the world in the San Joaquin and otber valleys of California and Arizona, which land only nseds to be "tickled with water to make it langh with the harvest." Only a small part of this land can bs irrigated by the usual methods, but water exists, in inexhaustible quantitias, in most localities, at from 10 to 100 ft. from the surface. By driviug a number of tube wells, say 15 ft. apart, and coupling them together at the tops and applying a sun engine, a supply of water can be obtained for irrigation and for cattle, which would raise the value of the land from $2 to $5, its present price, to $30 and $60 per acre, and fill these valleys with a prosperous and happy population. This is a phase of the solar engine business which should commend itself to the owners of the large ranches in the interior valleys, where the conditions are most favorable for the development of this enterprise. We are not unmindful of the objection that the aolar rays are sometimes interrupted by olouds, and that at best such an eogine would be available only in the day time, but we auswer that in the summer time, during our rainless season, when their need would be greatest, the sky is seldom obscured by clonds (it has been demonstrated that occasional passing olouds have no perceptible effect on the apparatus), and the power of the engine could be nsed for compressing air or generating electricity, which might he stored, and the elsctricity or compressed air would serve to run the machinery in the night. In this way the cities on the plains could also be lighted by electricity at a minimum cost.

All know that the sun generates immense quantities of heat, and nothing is wanted to utilize such heat except an efficient apparatus for collecting the rays and concentrating them upon a smaller surface. It has been demonstrated by Ericsson, Muchot, and othera that the heat of the snn, after absorption by our atmosphere, represents rather over one-horse power psr square yeur, and that we get more heat (other things being equal) on a day in winter than in summer, for the sun is nearest to us in onr northern winter.



GRAY'S PATENT NOISELESS DOUBLE ROLLER MILL.

In hia very interesting address to the British Association, in 1881, Sir W. Armstrong, C. B., D. C. L., L. L. D., F. R. S., referring to the proposition of utilizing the solar rays for generating electricity for light and for motive power, said: "In our climate (England), it is true, we shall never be able to depend upon sunshino for power; nor need we repine on that account so long as we have the preserved sunbeams which we possess in the condensed and portable form of coal; but in regions more favored with sun and less favored with coal the case is different. The actual power of the sun is enormous, being computed to be equal to melting a crust of ice 103 ft. thick over the whole earth in a year. Within the tropics it would be a great deal more, but some deduction must be made for obsorption of heat by the atmosphere. Taking all things into accouot, however, we shall not be far from the tnith in assuming the solar heat to be capahle of melting annually, at the surface of the ground, a layer of ice 85 it. thick. Now lot us see what this means in mechanical effect. To melt one pound of ice requires 142'4 Eoglish units of heat which, multiplied by 772, gives us 109.032 foot-pounds as the mechanical equivalent of the heat coneumed in melting one pound of ice. Hence we find that the solar heat, operating upon an area of one acre, would, if fully utilized, exert the amazing power of 4,000 horses acting for nearly nine hours every day.

Io dealiug with the snn's energy we could afford to be wasteful. Waste of coal means waste of money and permanent exhaustion of coal beds. But the sun'e heat is poured upon the earth in endless profusion—endless at all events in a practical sense—and we have, therefore, only to consider whether we can divert to our use so much of the sun'e motive energy as will repay the cost of the necessary apparatus; and when snch an apparatus is forthcoming we may expect to bring into subjection a very considerable proportion of the 4,000 invisible horses which science tells us are to be found in every acre of sun-kissed ground.

Professor Langley of the Alleghany, Pa., observatory, in closing an exhaustive report on the experiments of Ericsson and Muchot and the great need of a substitute for fnel, says:

"Engineers have done little to solve thia important problem, which problem is pursly mechanical, but we may be sure they will do more in the future, for the demand for motive power ia rapidly increasing, and the supply of coal and wood is approaching exhanstion. Future ages, it has been truly said, may see the seat of empire transferred to regions of the earth now barren and desolated under great solar heat—countries which, for that very canse, will not improbably become the seat of mechanical and thence of political power. Whoever finds the way to make industrially useful the vast sun power now wasted will effect a greater change in men's affairs than any conquerer in history has done."

We have on this coast a vast field in which an apparatus for utilizing solar heat, as proposed, would be very nseful and valuable.

The Roller System of Flouring.

Our readers are doubtless aware, from what has been said from time to time in these columns, that the roller system of flour milling is fast superssding the old method of stone grinding. Upon this coast, as well as at the East and in Europe, the new system is making rapid and wide advances. This being the case, we have secured for illustration one of the leading machines used in the new process, and one which is now being largely introduced into the mills of this State. It is used by the Golden Gate mills, of this city, where they have 48 double roller machines, giving a capacity of 1,000 barrels in 24 hours, and other mills are making the same reform in their operations by the use of the same rollers.

The machine shown in the engraving is styled Gray's Patent Noiseless Roller Mill, manufactured by E. P. Allis & Co., of Milwaukee, Wis., who have led in this country in the designing and manufacture of roller mills, and have sent many of their mills to foreign parts. The system of grinding embodied in the Gray Roller Mills consists essentially in gradually reducing the wheat to middlings, and the middlings to flour, by several successive operations, each followed by bolting and purifying while both the offal and flour particles are in large pieces and much easier to handle than the product of the old system; and when this is successfully carried out a perfect and clean separation of the bran, germ and impurities of the flour is obtained. The leading features of the system are: 1st. A thorough and systematic cleaning of the wheat with the most improved scouring and brush machines and separators, for the elimination of extraneous seeds and dirt. 2d. That the granulation of the wheat shall be done entirely by corrugated chilled iron rolls in four to six successive reductions or breaks; the rolls on the first break to have the coarsest corrugation, and increasing in fineness through the several reductions or breaks to the final bran-cleaning roll. There should be as little flour made as possible during this operation, as it will necessarily be of lower grade than middlings flour, and the bran should be finished up clean. 3d. The separation of the flour, middlings and chaff from the several breaks by means of metal and silk bolts and aspirators. 4th. The systematic and thorough grading and purifying of the middlings by means of graders and air and sieve purifiers. 5th. The sizing of large middlings on smooth chilled iron rolls, with but slight differential motion, in order to reduce them in size preparatory to flouriog, and to eliminate, by flattening, what germs and bran specks may have adhered to them. 6th. The final reduction of the fine, clean middlings to flour by means of porcelain rolls having light prsseure and high differential motion. 7th. A full and complete system of bolting. By this roller system from one-fourth to one-third more flour can be made with the same power, the yield is largely increased, and the flour of much higher grade than by the old system. These great improvements in the art of milling explain the general introduction of the roller system in the large milling establishments of the world.

NEW MONTANA MINES.—There promises to be a great rush, principally from the Black Hills, to the mines in the vicinity of Fort Maginnis. The mines are being quite extensively advertised outside the Territory; and those who have claims there appear to have almost unlimited confidence in the future of the camp. Two new towns were recently laid out in Spring gulch, named respectively, Alpine and Rustler; and corner lots in the last-named town are held as high as $1,500, so we are informed. There is little doubt but a number of rich quartz ledges have already been struck in the Maginnis district, but whether the present prospects and developments will justify the great boom that appears to be setting it remains to be seen. —*Bozeman Courier.*

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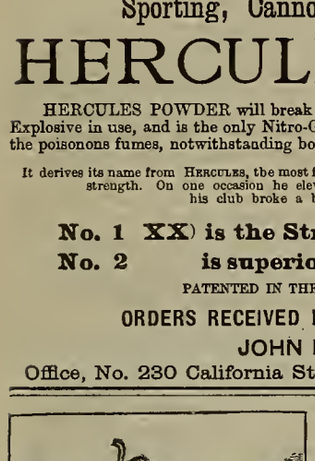

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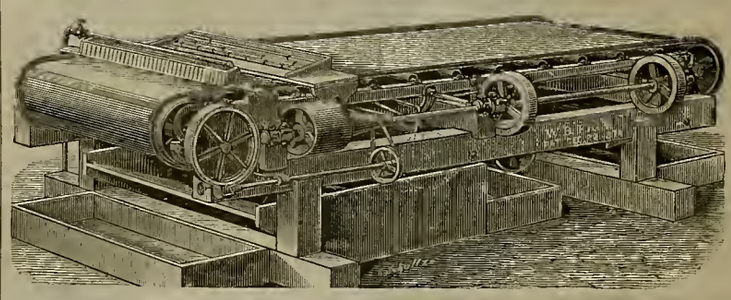

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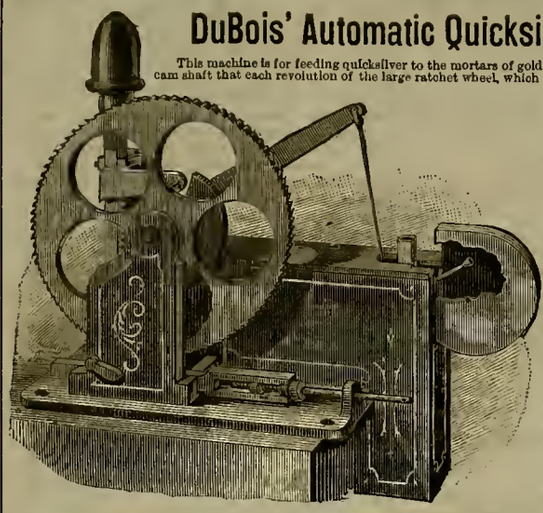
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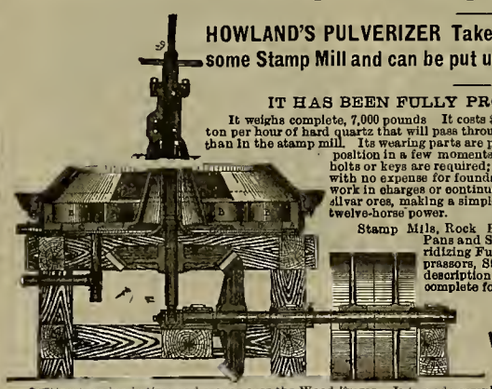
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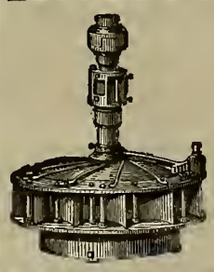
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Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

GLOVE.—Henry S. Flood, S. F. No. 256,558. Dated April 18, 1882. In the construction of heavy gloves for drivers, wood-cutters, and others who must labor in inclement weather, leather, buckskin, and similar materials are employed for strength and to resist rough usage, while woolen, knit, woven, or other similar material is employed for warmth. Those, however, who are obliged to drive in cold, wet weather, find their gloves soon wet through from the back, and the hands become benumbed. Mr. Flood's invention is designed to overcome this difficulty, and it consists in the application of a waterproof backing, of any suitable material, to gloves, mittens, gauntlets, or other hand-covering of whatever material, so that the hands will be protected from wet, and the material of the glove itself will keep them warm. The method of construction is such that while the inner part of the glove may be made of a cheap and flexible material, the inventor avoids incasing the whole hand in rubber, or other waterproof substance, which will retain the perspiration of the hands, and soon make the interior of the glove wet and uncomfortable.

FLOATING DRY DOCK.—Life C. Watts, S. F. No. 256,608. Dated April 18, 1882. This invention consists in a large lifting dock, or float, the whole bottom of which is an air-chamber. It has upright sides, divided into compartments, designed for holding water to sink the dock. Between the upright sides is a wide channel, or space, large enough to receive a vessel. A smaller float, or pontoon, provided with appropriate devices for receiving and sustaining the vessel is adapted to be sunk upon the large dock, and the vessel is hauled in upon this pontoon. The large dock is adapted to be raised or sunk in vertical ways, or guides, and between two wharves, on which are supported water tanks provided with gates, from which the upright compartments of the large dock are filled with water and sunk to the required depth. These compartments are provided with gates operated from above, which, when opened, allow the escape of the water and the consequent lightening and raising of the large dock, together with the small pontoon, from which the water is allowed to escape, and the vessel. There are minor points of construction which are required for the operation of the device.

LOGGING ENGINE.—John Dolbeer, S. F. No. 256,553. Dated April 18, 1882. In the logging business, after trees have been felled and cut up into suitable lengths, the logs often lie in inconvenient and inaccessible places, and as many of the redwood logs which are cut upon the Pacific coast run from 4 to 12 ft. in diameter, they are very unwieldy to handle. In order to bring them to a point where they can be loaded for transportation or brought to the mill, it is necessary to employ large teams of horses or oxen. This invention is designed to provide a convenient apparatus, which is mounted on a sled-like frame, and is provided with appliances for the guidance of ropes and tackle, by which the engine may move itself to any desired position, where it may be secured by suitable chains, by which it is anchored to stumps or trees. By means of attachments and guides, the tackle may be made to work at any angle and in any direction from the apparatus, so as to move a log to any desired point.

CHAIR BRACE.—John A. Gallagher, Chinese Camp, Tuolumne county, Cal. No. 256,562. Dated April 18, 1882. This is intended to hold securely the legs of chairs to prevent them from spreading. It consists of wires or rods attached to the bottom of the legs and to the seats above, said wires being made to converge toward the center under the chair and between the legs, and there adapted to be tightened or loosened by the separation or approach of two plates or disks operated by a thumb-screw.

COLLECTOR ROBERTSON, of New York, has instructed Special Agent Brocket to make careful investigation in regard to recent importations of sugar. It has been represented to the collector that certain parties, whose names are witheld for the present, have been evading paying duty, by bringing sugar from the East Indies to the United States via the Hawaiian islands. After being taken to the islands in a raw state, the sugar is put through the centrifugal process; then it is shipped to San Francisco, where it is entered as the Hawaiian product from San Francisco it is sent direct to New York.

THE NORTHERN PACIFIC.—The Northern Pacific has now built through Oregon into Idaho, and nearly 300 miles west of Bismarck, leaving a gap of 600 miles to complete the road. The company has used up $20,000,000 and called another $1,000,000 from its subscribers, and unless a panic can be precipitated by artificial means during the present spring, this railroad—which was the point that yielded and made the panic in 1875—will be a reality between the two oceans.—*Rocky Mountain Record.*

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

3721. Chalcedony—Cave near Volcano, Amador county, Cal. S. W. Collins.

3722. Stalactite—Cave near Volcano, Amador county, Cal. S. W. Collins.

3723. Pyrophylite—Greaser gulch, Mariposa county, Cal. Richard B. Thomas.

3724. Steatite Much Resembling French Chalk—Pine Flat, Sonoma county, Cal. McIntosh & Co.

3729. Lead Pipe Gnawed by Rats to Obtain Water—House 656 Folsom St., San Francisco, Cal. J. Z. Davis.

3730. Cinnabar Concentrated from Low-Grade Ores—Guadelupe quicksilver mine, Santa Clara county, Cal. B. B. Thayer.

3731. Ilmenite in Quartz—Near Buchanan, Mariposa county, 30 miles south of Mariposa. Richard B. Thomas.

3732. Breccia—Hills back of Oakland, Contra Costa county, Cal. B. F. Merrill.

3733. Aragonite—Cerro Gordo, Inyo county, Cal. S. D. Woodhull.

3734. Rock Specimen—Los Angeles county, Cal., seven miles from Alpine station. R. B. Woodward.

3735. Rich Copper Ore—Native copper, Napa county, Cal. Dr. J. W. Hood.

3736. Shale, with Lignite—Near San Bernardino, San Bernardino county, Cal. Capt. R. Estterbsy.

3737. Hollow Bit of Diamond Drill, with Core—From Altura gold and silver mine, Hope valley, Alpine county, Cal. Edward Barnes.

3738. Silver Ore—Outside mine, El Dorado canyon, White Pine county, Nev. S. A. Winall.

3739. Rich Copper Ore, Native Copper and Cuprite—Said also to contain gold and silver. Douglas county, Oregon. Dr. J. W. Hood.

3740. Silver Ore—Mountain View mine, near Hot creek, Nye county, Nev. Assay, $7.14 (?) per ton. Scupham & Bullock.

3741. Silver Ore—Horn Silver mine, Frisco, Utah. F. E. Monteverde.

3742. Aragonite—Pierpont mine, Eclipse district, Arizona. S. M. Parsons.

3743. Rock Salt—As brought to San Francisco from Liverpool.

3744. Complex Ore—Alhiou mine, Meadow Lake, Nevada county, Cal. This specimen will be carefully analyzed and the results published.

3745. Complex Ore—Excelsior mine, Meadow Lake district, Nevada county, Cal.

3746. Graphite—Near Pine Flat, Sonoma county, Cal. Wm. Raynor.

3747. Quartz Crystals, Including Rutile—Near Humboldt house, Humboldt county, Nev. Wm. Montgomery.

3748. Molybdenite—Minnie mine, Sweetwater range, Mono county, Cal. S. W. Frost.

3749 Jasper—Litt e Shasta, Shasta valley, 14 miles east of Yreka, Siskiyou county, Cal. Dr. F. G. Hearn.

3750. Nodule (Hollow) Hematite—Near Volcano, Amador county, Cal. S. W. Collins.

3751. Sample of Soil—Frink's spring, Colorado desert, San Diego county, Cal.

3752. Salt—Mud Volcanoes, at Volcano station, S. P. R. R., Colorado desert, San Diego county, Cal.

3753. Average Sample of Soil—Near Volcano station, S. P. R. R., Colorado desert, San Diego county, Cal.

3754 Sample of Soil—Five miles east of Volcano station, S. P. R. R., Colorado desert, San Diego county, Cal.

3755. Sample of Soil Two miles east of Frink's spring, Colorado desert, San Diego county, Cal.

3756. Magnetite—Mohawk valley, Sierra county, Cal. Sierra Iron Co.

3757. Magnetite—Near St. Helena, Napa county, Cal. Dr. J. W. Hood.

3758. Metallic Iron Reduced from Magnetite—Found near St. Helena, Napa county. (No. 3757.)

3759. Magnetite—San Bernardino county, Cal., six miles from water.

3760. Iron Ore, Limonite and Hematite—San Andreas, Calaveras county, Cal. W. D. Allen.

3761. Iron Ore, Hematite—Near St. Helena, Napa county, Cal. E. W. Woodward.

3762. Iron Ore, Limonite—San Luis Obispo county, Cal., on the Rancho Morey county. E. J. Elsy.

3763. Iron Ore, Limonite—Township 4 north, range 10 east M. D. M., opposite section 3 in unsurveyed land, two miles in a southerly direction from Campo Seco, Calaveras county, Cal. A. M. Thrift.

3764. Jaspery Iron Ore—Near Campo Seco, Calaveras county, Cal. This is probably the same as No. 3763. J. L. Sanford.

3765. Iron Ore, Limonite—Iron Monarch mine, Campo Seco township, Calaveras county, Cal. (See No. 3763). C. Berger.

3766. Iron Ore, Hematite—Big Tree iron mine, Calaveras county, Cal. M. Attwood.

3767. Iron Ore, Magnetite—Grass Valley, Nevada county, Cal. M. Attwood.

3768. Iron Ore, Magnetite—Near Benton, Mono county, Cal. Analysis by Falkenau & Reese: Peroxide of Iron, 93.05; silica, 7.00; traces of sulphide of copper. This ore is said to be in very large quantities.

3769. Iron Ore, Magnetite—Compact variety. Texada island, Straits of Georgia, British Columbia. Redington & Co.

3770. Iron Ore, Magnetite—Cellular variety. Texada island, Straits of Georgia, British Columbia. Redington & Co.

3771. Iron Ore, Hematite (Bog Ore)—Chinicum mine, Port Townsend bay, Washington Territory. Redington & Co.

3772. Pyrolusite—Three miles from Cloverdale, Sonoma county, Cal. S. A. Raymond.

3773. Iron Ore, Hematite—Holden ledge, township 15 north, range 7 east, M. D. M., Nevada county, Cal. G. A. Holden.

3774. Iron Ore, Limonite—Twenty-five miles east of Visalia, Tulare county, Cal. Good road, plenty of wood and limestone; mine lies between two rivers (See No. 2287). Henry Miller.

3775. Diatomaceous Earth (Called Chalk)—Doolan mine, near Santa Rosa, Sonoma county. H. T. Holmes.

THE United States internal revenue cutter *Corwin* has sailed for the Arctic, under command of Lieutenant Healy. It is said the instructions from the Department at Washington to the commander are to the effect, if he is not able to communicate with the crew of the ill-fated *Rodgers* by water, to endeavor to do so overland, or across the ice. The *Corwin* has been preparing for some time for a six months' cruise in the Arctic regions, and all that was necessary to place her in immediate readiness to start was to take on coal and water, which was done, and in less than 48 hours after receiving her orders, she was steaming out of the bay.

THE "MINING AND SCIENTIFIC PRESS" OF SAN FRANCISCO.—This live and readable journal is fast reaching ahead of its Eastern competitors of a similar class, as it is eminently progressive and always filled with matter of a most interesting character. Evidently there is much care taken in preparing articles that are suitable and acceptable to the readers its kind of information is intended for.—*Arizona Quarterly Illustrated.*

AFTER expending several thousand dollars in experimenting on the one-track railroad in Tulare county, the enterprise has been abandoned. The track and rolling stock were sold under attachment, and the engine will be used in hoisting coal from a mine near Huron.

HEALTH AND RECREATION.—This State has long enjoyed the reputation of possessing some of the best mineral springs in the country, and this fact, together with its healthful climate, accounts for the beneficial results which have followed a visit to these springs by many invalids. Now is the time for those intending to take a trip to the country during the hot summer months to be looking about for a suitable place, and to such we would say, try the Siegler Springs, Lake county, which are situated in a beautiful location, with good hunting and fishing close at hand, where the best of accommodations can be secured at reasonable rates. The Springs can be reached in one day from S. F., the Springs coach connecting at Lower Lake with the stage from Calistoga on Monday, Wednesday and Friday, and at Glenbrook on Tuesday, Thursday and Saturday. Among the important improvements which have lately been made is a large swimming bath. Springs are flowing out of the ground in a great many places on the property, containing iron, soda, arsenic, magnesia, etc., and many remarkable cures have been performed from the use of these waters. Persons intending visiting the resorts, whether for health or pleasure, will do well to read the advertisement of the Siegler Springs in this issue of our paper, and send to Mr. W. T. Garratt, manager of the Springs, who will cheerfully give any information which may be desired.

THE Southern Pacific railroad company has inaugurated a complete system for taking care of sick or injured employes, and for providing those who are permanently injured with suitable employment. A tax for the Hospital Fund of fifty cents is levied on the monthly salary of each employe. The hospital is situated at Tucson, and all the sick on the line between Yuma and El Paso, are sent there and cared for free. About twenty patients a month are received.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

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A large cylinder Hoe printing press, for country newspaper work, can be bought cheap by addressing Press, Box 2361, S. F.

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We want several canvassing agents who will make it their business to solicit subscriptions and advertising for our first class progressive newspapers. Men of ability and experience can secure good pay and permanent employment. Send references and state your past occupation, etc., to the publishers of this paper.

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We have some desirable rooms to let adjoining the offices of this paper which will be rented on favorable terms. Stair entrance, No. 252 Market St. Elevator, No. 12 Front St. Parties wishing offices, etc., will do well to call and see them. DEWEY & CO.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

HOW TO STOP THIS PAPER.—It is not a difficult task to stop this paper. Notify the publishers by letter. If he comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter.*

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $8 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

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Mining and Other Companies.

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Bullion Mining Company.—Location of Principal place of business, San Francisco, California. Location of works, Gold Hill Mining District Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 29th day of March, 1882, an assessment (No. 23) of Thirty (30c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, Room 3, Safe Deposit Building, 328 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the second (2d) day of May, 1882, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the twenty-fourth (24th) day of May, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. M. BRAZELL, Secretary.

Office—Room 3, Safe Deposit Building, No. 328 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE EUREKA CONSOLIDATED MINING COMPANY, Nevada Block, Room 37, San Francisco, April 15, 1882.—At a meeting of the Board of Directors of the above-named Company, held this day, a dividend, (No. 72), of Fifty Cents per share, was declared, payable on the 27th of April, 1882. Transfer books closed until the 28th inst. W. W. TRAYLOR, Secretary.

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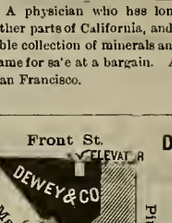

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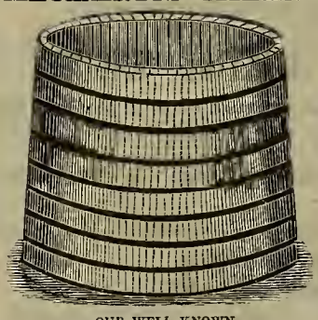

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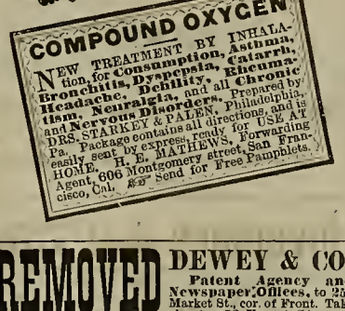
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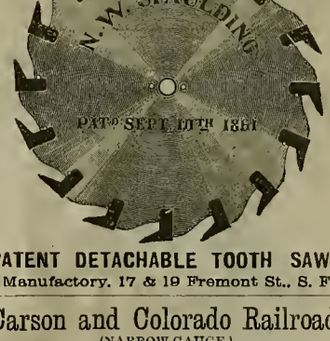

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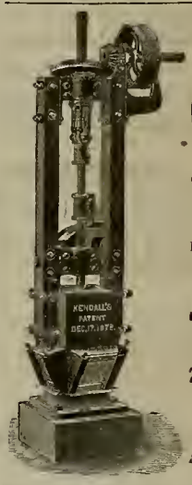
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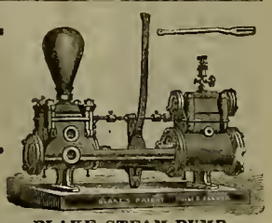

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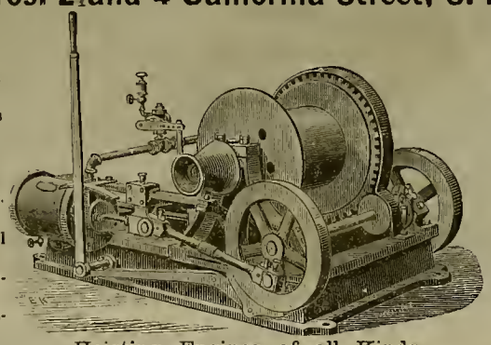

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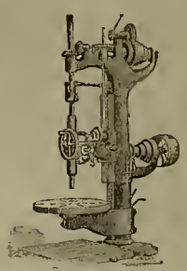

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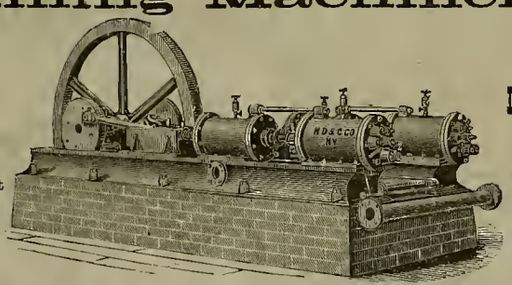

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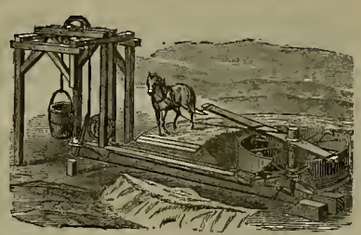

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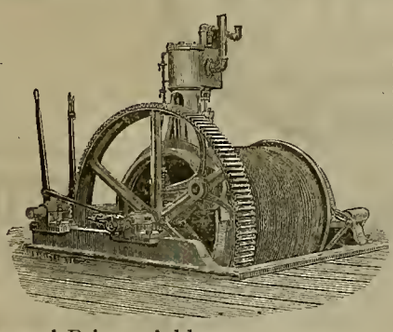

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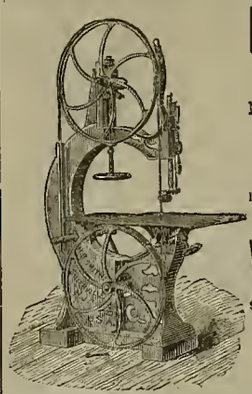

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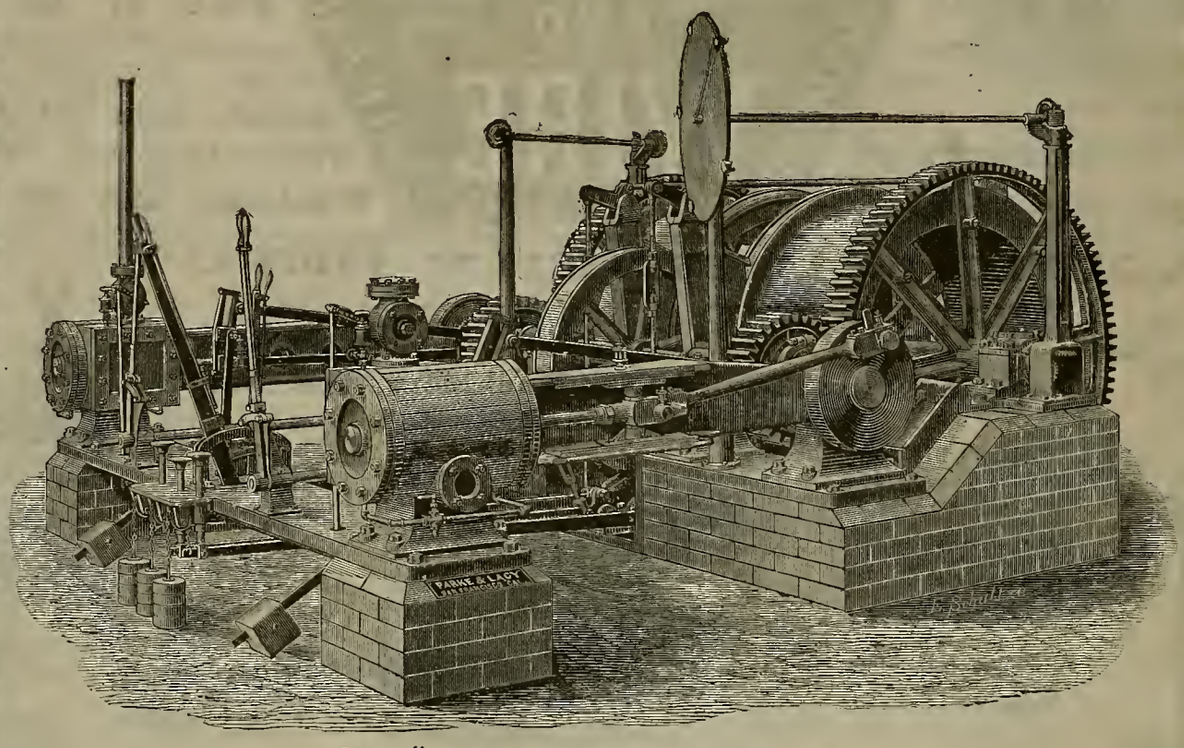

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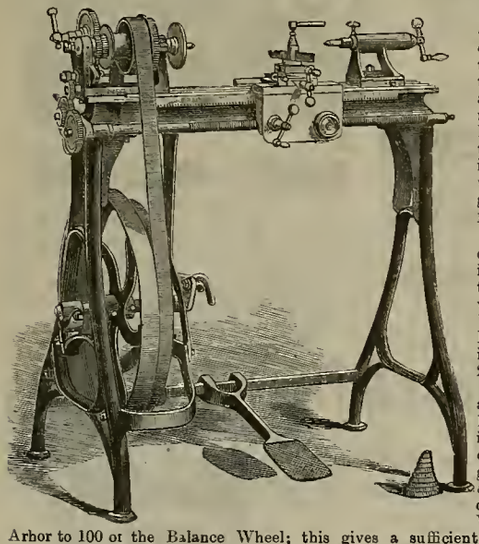

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The Arbor in Head Stock has a ⅝ inch hole through it, which is very convenient for turning the ends of long rods, making small screws, studs, &c. The Centres are ½ inch diameter. There is an attachment in Head Stock for reversing the motion of Carriage.

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VOLUME XLIV Number 18

The Paper-Bag and Envelope Trade.

The paper-bag and envelope trade has grown to enormous proportions, and necessity has compelled the invention and adoption of many improvements in the mechanical appliances. Where, formerly, all the work was done by hand, machinery carries out the details more perfectly, rapidly, and with more economy. We illustrate, on this page, the most improved device employed in the trade—the Eureka paper-bag and printing machine. It is among the first successful paper-bag and envelope machines which does this class of work more neatly and quickly than by hand. It will work all kinds of paper, and make all sizes of bags or envelopes. A 12-year-old boy or girl, with a few hours' instruction, can run it, and make from 6,000 to 8,000 a day.

The machine folds, pastes, prints and counts the bags at the same time they are made. The engraving shows what the apparatus looks like. On the top of the table and hinged to its rear edge is a plate, which is called the "forming plate." This lies transversely on the table, and is adapted to have a vertical swing by means of treadle and connecting rod as shown. When the treadle is pressed down, the forming plate is drawn down flat on the table, and when the foot is taken from it, a weight, cord and spring return it to its place.

Upon the table, on each side of the forming plate, are the folding plates. These have guides on their lower surfaces, which fit in slots in the table, and they are thus adapted to slide toward each other, or to recede, one of them being made to start first and the other to move as soon as the first has started. The guides rest on rollers journaled under the table, and are thus enabled to slide easily, as well as being supported. They approach each other, but do not touch. Both folding plates pass above the forming plate. This movement is upon the ordinary principle of paper-bag machines of this class, but peculiar mechanism carries out the movement.

The paster consists of a trough, below which is the roller pad. The bottom of the trough has an aperture its entire length, so that the pasting material which is put in the trough passes through upon the pad. The trough has a shank, which is journaled upon a shaft attached to the table. Upon the same shaft is an arm, which extends forward under the horizontal arm of the bell-crank lever. When this arm of the lever is depressed, it presses down the arm and causes the pasting pad to descend and come in contact with the paper below. A raised ridge upon the plate holds the end of the paper up to receive the pasting pad.

There is also a device for folding over the bottom of the bag upon the sides, after they have been folded by the plates. It consists of a roller having an inclined front, behind which is another roller. This plate is adapted to slide forward upon the table, and, like the folding plates, it has guides, which pass down through slots in the table.

Other levers and arms act in a similar manner to paste the bottom of the bag.

The mechanism operating the plate which folds over the bottom of the bag upon the sides is quite ingeniously contrived, and would have to be seen in operation to be appreciated.

The printing attachment performs its work during the operation. In the top of the table is a hole, just about where the center of the bag comes. Beneath this hole, and secured to the under side of the table, is a vertical frame having suitable guides. In this frame is the printing stamp or form, containing any device or words found desirable for advertising. The printing form has secured underneath vertical rods, which pass down through the guides of the frame. The stamp, or form, is directly under the hole, and is adapted to be raised up through it to touch the bag above.

In order to keep the stamp supplied with ink, passing under the table transversely and lying upon appropriate guide rollers is a strip. One end of this extends towards the stamp and is provided with an ink roller. This is adapted to move back and forth over the stamp by peculiar and simple mechanism.

Another improvement in this machine is a device for counting the bags. The treadle and a ratchet wheel are so connected that, for every 50 bags made, a bell is made to sound. The forming plates can be changed to larger or smaller sizes, and the paster be adjusted to the changed sizes.

The device for automatically pressing and removing the bags or envelopes is a new feature also. A thrower marked *B* takes the bag after it is made and throws it on the endless belt, *A*. While the next bag is being made, the endless belt, *A*, carries it forward and passes it under the roller, *C*, and presses it out and then drops it into a box. Here it stays until the sound of the bell indicates that 50 are completed. They are then gathered up and put away in packages. This device is the invention of Anthony Beyer,

BEYER'S PAPER BAG, ENVELOPE AND PRINTING MACHINE.

of this city, who has recently obtained a patent for it through the MINING AND SCIENTIFIC PRESS Patent Agency.

A COMPANY of capitalists having recently purchased the Borax Lakes, are making arrangements to work them. There are two lakes, one at the head of Death valley, in Inyo county, and the other about 40 miles distant, near Resting springs. The surface of the earth is covered with a crust similar to Soda lake, and at a depth of about a foot the borax is encountered. These mines are very valuable. The nearest trading point is San Bernardino.

ESPERANZA mining district, at Jurupa, has been organized. Considerable excitement is prevailing at Riverside over the discovery of these mines. The mines lie in the hills north of Jurupa, and consist of a deposit of ore two and one-half miles wide by seven and one-half long.—*San Bernardino Herald.*

THE ten-stamp mill of Little Emma mine at Lundy, Mono county, will be brought in as soon as the snow gets off the Lake Canyon road, so that the machinery can be hauled direct to its destination.

The Kiss Process.

The use of alkaline or earthy hyposulphites for the extraction of silver from ores originated in Europe, having been suggested by Dr. Percy in 1848, and first applied in practice by Von Patera, in 1858, at Joachimsthal. Von Patera also used the sodium hyposulphite for the leaching and the sodium polysulphide for the precipitation. This method was modified by Kiss, who substituted the calcium salts for those of sodium.

The Kiss process, we learn, in Mr. Aaron's "Leaching of Gold and Silver Ores," was first successfully introduced on this coast by Kustel and Hoffman, in Mexico, after abortive attempts had been made by others in Lower California. It met with such success as to supersede amalgamation in the treatment of silver ores throughout the State of Sonora and the Territory of Lower California, and was even known among ill informed people as the "Mexican process." It has been gradually growing in public favor, the principal obstacle to its extensive adoption in the silver regions of Nevada being the circumstance that the ores of that State usually carry more or less gold, which, while frequently not justifying the application of the Plattner process, is but partially, and almost by chance, extracted in the Kiss silver process.

One great objection to the use of the Plattner process in these cases is the cost of acid, the transportation of which is troublesome and expensive. It is therefore desirable that some means of developing pure chlorine from salt cheaply, without the use of acid, should be devised.

BENJAMIN F. DELANO, formerly United States Naval Constructor, died in Brooklyn on Saturday, aged 75. He had a good deal to do with Perry's expedition to Japan and Kane's expedition.

The Anti-Debris Convention.

The following resolutions were adopted at the Anti-Debris Convention held at Sacramento this week:

WHEREAS, At least 100,000 acres of the finest lands in the Sacramento valley have already been destroyed, and hundreds of thousands of acres of such lands are now in imminent danger of destruction by the unrestrained flow of detritus from the hydraulic mines on the headwaters of the several tributaries of the Sacramento and San Joaquin rivers: and whereas, the said flow of detritus has already filled the channel of many miles of the navigable rivers of the State, and its continuance must result in a very short time in the complete destruction of said rivers and their tributaries, throwing them, in broad, shallow, muddy streams, over the fairest portion of the State, annihilating not only the productiveness of the lands, but the cities, towns and villages; and

WHEREAS, The navigation of the bay is now imperiled, and the harbor itself must at no distant day succumb to this devastating agency, and ruin overtake the metropolis of the Pacific, thus completing a picture of desolation never before beheld by the civilized world; and

WHEREAS, There are but few individuals or corporations comparatively engaged in this species of mining; and

Resolved, That it is the duty of the State of California, as a moral person, endowed with rights, and resting under obligations, to defend herself against such fearful mutilation, and protect the people of the valleys in the peaceful and undisturbed enjoyment of the fruits of their labor.

Resolved, That we indorse the action of Attorney-General Hart, in bringing suit against some of the hydraulic mining companies, in the name of the State, to test the right of one man in the pursuit of wealth to destroy the property of another, as well as the common heritage of this and future generations—the navigability of the rivers of the State.

Resolved, That, as experience has taught us that the water will readily carry off, without serious consequences, the washings of quartz and drift mining, we wish to say in the most emphatic manner to the miners of the State that we have no contest with any one engaged in such mining.

Resolved, That we have no contest with those hydraulic mines which take care of their debris, but it is against those, and those only, which wash great areas of earth into our streams.

Resolved, That the political party that does not recognize the just principle that every man must so use his own as not to injure his neighbor, is not worthy the support of the people.

Resolved, That the attention of the press of the State, especially the metropolitan press, is called to the immense importance of this matter, and to the fact that it has, in our judgment, failed to take that comprehensive view of the subject which its importance demands.

Resolved, That the people of the Sacramento valley demand of the executive, legislative and judicial branches of the State that just protection of our property for which governments are established and maintained.

Resolved, That the contest already begun against this system of desolation and destruction of our State is a sacred cause, which should enlist the sympathies and active co-operation of all her people; that the burden of the conflict should not be borne by the few who have heretofore struggled to stay this great destroyer, but should be shared by all the people of our great valley; that in order to reinforce those who are now at the front to concentrate all efforts in united action, we do most earnestly recommend that the several Boards of Supervisors present on this occasion meet together and take such action in the premises as will enable their several counties to contribute that aid and encouragement which only united action can bring; and we hereby pledge ourselves to the support of such action.

Resolved, That the action of the Board of Supervisors of Sacramento county, in calling this convention together, meets the unqualified approval of the people of this valley.

Italian Rocks and Contained Minerals.

(Continued from last week.)

3893. Galena of large, lamellar, crystalline structure, with chalcopyrites (one beautiful tetrahedral crystal), calcite in rhombohedral crystals piled one upon another parallel to the base, opaque-white quartz, etc., in talcose schist. Bottino lead mine, Stazzema (Lucca). Valle del Vezza, Apuan Alps.

3894. Chalcopyrite and panabase. Frigido copper mine, Massa (Massa and Carrara). Valle del Frigido, Apuan Alps.

3895. Pirrotina, from the lead lode, Bottino lead mine, Stazzema (Lucca). Valle del Vezza, Apuan Alps.

3896. Hetromorphite in magnificent capillary crystals. From the lead lode, Bottino mine, Stazzema (Lucca). Valle del Vezza, Apuan Alps.

3897. Lead-gray, argellaceous schist. Cogoleto (Genoa). Riviera di Ponente.

3898. Lead-gray, mica-schist. Savona (Genoa). Riviera di Ponente.

3899. Cassiterits, containing, as a mean product, 46% of tin. Richest ore mins of ths Cento Camarelle, Campiglia Marittima (Pisa). Ths nature of the lode and its geological relations are as yet unknown, but the lode is in the vicinity of granite, though not in it. The mine is supposed to have been worked at least 1800 years ago, hy the Romans, as an immense number of extremely ancient workings have been discovered all around.

3900. Cassiterite, from the mins of the Cento Camarelle. Rich ore. Campiglia Marittima (Pisa).

3901. Cassiterite of brick-red color. Mine of the Cento Camarelle, Campiglia Marittima (Pisa).

Prepalœozoic Group—St. Alban's System.

3902. Fine-grained, crystalline marble, of a delicate pearl-gray tint. Zantiscritti quarry, Carrara (Massa and Carrara). Apuan Alps. Termed in architecture Marmo hianco ordinario di seconda qualita. A very strong, good material for out-door work; not so beautiful in appearance as the following specimens. See Jervis' "Mineral Resourcee of Central Italy."

3903. Fine-grained, crystalline marhle of a pearl-gray or bluish tint. Termed in architecture, Marmo hianco ordinario di prima qualita. Zantiscritti quarry, Carrara (Massa and Carrara. Apuan Alps. See Jervis' "Mineral Resources of Central Italy." A splendid material for monuments and out-door architectural works in general; resists the atmospheric influenccs very well.

3904. Pearl-hlue, fine-grained, crystalline marble of great strength, admirably suited for architectural purposee. Piastra quarry, Carrara (Massa and Carrara). Apuan Alps.

3905. Pearl-hlue, fine-grained, crystalline marble, termed in architecture, Marmo hianco ordinari di seconda qualita. Canal Bianco quarry, Carrara (Massa and Carrara). A very excellent material for open-air architectural work, and one which admirably resists the atmospheric agencies. Less white than the other sample from this quarry. See Jervis' "Mineral Resources of Central Italy."

3906. Fine-grained crystalline white marble; termed Marmo bianco ordinario di prima qualita. Canal Bianco quarry. Carrara (Massa and Carrara), Apuan Alps. The best kind for architectural in-door purposes, hut less suited for exposure to the air than the former variety.

3907. Best pearl-gray, finely-crystalline marble; termed Marmo hianco ordinario di prima qualita. Ravaccione quarry, Carrara (Massa and Carrara), Apuan Alps. Mucb used for ordinary statuary and is highly esteemed for decorative purposes. Ravaccione marble is a well-known typical stone.

3908. Snow-white crystalline marble of saccharoid structure; termed Marmo bianco ordinario di prima qualita. Canal Grande quarry, Carrara (Massa and Carrara), Apuan Alps. This is a specimen of the best kind of marble qnarried at this point. Admirahle for in-door purposes, but does not resist the action of frost and otber atmospheric agencies sn well as some other types, and on exposure to such causes and to much moisture, it crumbles to dust.

3909. Fine-grained, crystalline, snow-white marble, traversed hy ahundant minute purple-hrown veins of great beauty; termed Marmo pavonazzo. Boccauaglia quarry, Carrara (Massa and Carrara), Apnau Alps. The peacock marhle (so-called) is one of the most splendid and gorgeons ornamental building stones; when properly polished it makes the most beautiful columns and halustrades for churches; also paneling and other work where sawed marhles may be employed. Beiog very hard, aud heing found in very limited quantity, it is a most expensive marble.

3910. Pearl-gray crystalline marble of larger structure than the nther sample from this locality (No. 125). Canal Grande quarry, Carrara (Massa and Carrars), Apuan Alps. Is a splendid material for all architectural purposes, ss it resists atmospheric influences admirably; termed, in architecture and the arts, Marmo bianco ordinario di seconda qualita. Can also he sawed for general use. One of the best kinds of marble found at Carrara.

3911. Finely-crystalline white marble, with delicate bluish-gray veins; termed, in architecture and the arts, Marmo hiauco venato di seconda qualita. Used specially for internal decoration and for furniture, and is cut into slabs. Para quarry, Carrara (Massa and Carrara), Apuan Alps.

3912. Very fine-grained crystallinc white marble, with delicste slate-colored veins; known ss Marmo hianco venato ordinario. Vara qusrry, Carrara (Massa and Carrars), Aupuan Alps. A mnch-ssteemed marble for ornamsntal purposes. Not good for monuments in cemeteries. All the snow-white marhles are bad for this purpose, and it is a popular mistake in Europe to employ them for such nses, since the frost, sun and moisture together injure and destroy the material in a short time, the inscriptions getting eaten out and obliterated. The pearl-gray marbles shonld he rather used. This articls shonld be well perused hy all who desire to perpetnate the memory of those dear to them, whereas, by the wrong choice of the marbles, they do everything in their power to use a bad material simply hecause it looks prettier at first. See Jervis' "Mineral Resources of Central Italy."

3913. Very best, fine-grained, crystslline, white statuary marhle. Termed in sculpture Marmo statuario hianco di prima qualita. Polveccio quarry. Carrara (Massa and Carrara). Apuau Alps. When freshly quarried it is translucent in the thin edges, but soon loses this propsrty on long exposure to the air; whereas ths statuary marble from Crestola quarry always maintains its translucency. See Jervis' "Mineral Resources of Central Italy."

3914. Very heautiful, fine-grained statuary marble of best kind, called Marmo statuario di prima qualita. Bettogli quarry. Carrara (Massa and Carrara). Apuan Alps. This marble is translucsnt in thin piece, and somewhat porous, whence it easily absorbs soot in cities, and when cut into thin slahs is somewhat elastic. It should be employed as soon as it is quarried, and not left lying out of doors, so as to avoid the loss of specific gravity, which tskes place when exposed to inclement weather.

3915. Carbonate of iron in contact with wbite statuary marble, togetber with other colored mineral matte.s Th s associoiation of extraneous elements is termed hy the quarrymen madremacchia. It is welcomed as the iodication of tbe sure vicinity of the best statusry marhle within a few feet. Crestola quarry. Carrara (Massa and Carrara). Apuan Alps.

3916. Best white, fine-grained statuary marhle from the celehrsted quarry of Crestols; supposed to he the first of all the Carrara statuary marble quarries, and also one of the moet ancient. Carrara (Massa and Carrara). Apuan Alps. This sample is intsnded to illustrate the nature of the contact with the veins of compact gray limestone found in connection with the crystalline white marhles slong with the madremacchie.

3917. The most beautiful waxy-white statuary marhle, showing the contact with veins or fissures filled with carhonate of iron and hrown spar, togethsr with varions minutely crystalline minerals. Crestola quarry. Carrara (Massa and Carrara). Apuan Alps.

3918. Fine-grained crystalline marhle of waxy-white tint. Crestola quarry. Carrara (Massa and Carrara). Apuan Alps. Marmo statuario carnicino. The most esteemed marble in Europe for statuary. Does not alter hy exposure to the air, provided it he kept indoors. Very tenacious, so that the sharpest edgcs can he obtained in works of art. Has been qnarried for nearly 2,000 years.

3919. Gray dolomite of open crystalline structure. Accompanies the white crystalline marhles, and forms certsin strata independent of them. From ahove the village of Forno. Massa (Massa and Carrara). Valle del Frigido, Apuan Alps.

3920. Extremely fine-grained, pearl-blue crystalline marblc. A common kind. Termed in architectnre Marmo bianco ordinario di seconda qualita. Lavagrino quarry. Massa (Massa and Carrars). Valle del Frigido, Apuan Alps.

3921. Extremely fine-grained, crystalline whits marhle, Marmo hianco ordinario di seconda qualita. From ahove the village of Forno. Massa (Massa and Carrara) Valle del Frigido, Apuan Alps. Serves for sawing into slahs and for internal decorative purposes. Being of a perfectly opaque white, it is very good for architecture and ordinary statuary, as it gives sharp shadows. The grain is finer than that of Carrara marble in general.

3922. Very fine-grained, crystalline, white marhle, termed Marmo biancn ordinario Puissant di seconda qualita; from the qusrries above the village of Forno, Massa (Massa and Carrara) Valls del Frigido, Apuan Alps. An admirahle marble for sawing into slabs, and wherever it is not to he exposed to the air.

3923. Finely crystalline white marhle, termed in the arts Marmo hiancn ordinario. Piastrone qnarry. Massa (Massa and Carrara) Valle del Frigido, Apuan Alps. Emloyed for sawing into slahs for furniture and for a variety of purposes, hut especially for in-door work. Nnt suitahle for columns, and can be had in hlocks of 40 ft. long. The strata are nearly vertical at this place, hence the columns made frnm thie locality retain the original position of the stone and last longer in consequence.

3924. Fine-grained, crystalline, pearl-hlue marhle, termed Marmo hianco ordinario. Corchio quarry, Stazzana (Lucca). An excellent material for out-door work, resists the atmospheric influences very well. See Jervis' "Mineral Resources of Central Italy."

3925. Pearl-gray, crystalline, metamorphic marble, termed Marmo hianco ordinario di seconda qualita. Costa quarry. Serravezza (Luccs). Valle del Vezza, Apuan Alps. Mnch used for steps snd paving tilee for honses.

3926. Fine-grained, crystalline, white marble, possessing very dccidedly a stratified character, hence it can he essily obtsined in thin slahs for paving stones. Termed Mnrmo hianco ordinario di seconda qnalits. Ceragiola qusrry. Serravezzs (Lncca). Valle del Vezzs, Apuan Alps. See Jervis' "Min. Res. Central Italy."

3927. Pesrl-blue, crystslline marhle of fine structure. Costa qusrry. Serravezzs (Lucca), Valls del Vezzs, Apuan Alps. Is found in heds or strata very distinctly marked, and furnishes slahs suited for paving purposes. It is principally cut into pieces of small size, into flags of octsgonal, hexagonal or equare shspe, snch as are most extsnsively used in warm climates. Termed Marmo hianco ordinario di seconda qnalita. See Jervis' "Mineral Resources of Central Italy."

3928. Best fine-grained white statuary marhle. From the quarry on the Monte Altirsimo, Serravezza (Lucca), Valle del Serra, Apuan Alps. This was discovered and first worked by Michael Angelo. Gives excellsnt sharp shadows, whencs it is much prized in statuary. See Jervis' "Mineral Resources of Central Italy."

3929. Best fine-grained, crystalline, whits marhls of a magnificent warm tint. Termed Marmo statuario di prima qualita. Falcovsja quarry, Serravezza (Lucca), Valle del Serra, Apuan Alps. Much prizsd hy sculptors, and of very homogeneons structure.

3930. Crystallins marhle. Termsd Marmo pavonazzo (peacock marhle). Boccanaglia quarry, Carraia (Massa and Carrars), Apuan Alps.

3931. Pale Bardiglio marhle. Discina quarry, Carrara (Massa and Carrara). A splendid ornsmental stone.

3932. Crystalline marble. Termed Marmo hardiglio zonato chiaro. Carrara (Massa and Carrara), Apnan Alps.

3933. Pale Bardiglio marhle, with only small traces of hlackish blue veinings. Colonnata quarries, Carrara (Massa and Carrara), Apuan Alps.

3934. Crystalline marble. Termed Marmo bardiglio chiaro. Colonnata quarries, Carrara (Massa and Carrara), Apuan Alps.

3935. Pale hluish-gray Bardiglio marble, with dark veins. Collonnata quarriss, Carrara (Massa and Carrara), Apuan Alps. A splendid material for internal decoration; takes an excellent polish.

3936. Veined crystalline white marhlo. Termed Marmo hianco venato. Vara quarry, Carrara (Massa aud Carrara), Apuan Alps.

Profits in Gold and Silver Mines.

The Tombstone *Epitaph* says: Were people as easily satisfied with profits in silver as they are in gold mining then we might hope for Tombstone district to eventually become the seat of the largest mining industry on the continent. Ahout 10 years ago English companies bought the Sierra Buttes mine, in Sierra county, California, and the Eureka mine, in Plumas county, paying an even million of dollars for the latter. They have heen working them with the most satisfactory results to tbemselves ever since. The returns have hsen very low on tbe investment—for mining property—probahly not averaging over 10% per annum, one year with another, and yet, with this the owners are content. The production of the Sierra Buttes for February last was $24,373, and the total working expenses were $17,933, leaving a surplns of $6,440. At this rate of working the gross profits will not exceed $80,000 or 8% on a capital of 1,000,000. Plumas, Eureka, gave a total yield of $26,062, at a total cost of $18,310, leaving a surplus $7,752. This same rate continued for the year wonld give between $90,000 and$ 100,000 or ahont 10% on $1,000,000 capital. Now it ie safe to say tbat there are dozens of mines in Tombstone district that, were they opened and worked with anything like the system and with the appliances tbat contrihnte to make the Sierra Buttes and Eureka mines paying investments, that could he made to do even better than those mines are doing. Unfortunately people who invest in silver mines are not so easily satisfied with a low rate of dividends as they are in gold minss. Why this should he so we are not ahle to understand. Take the history of gold quartz mining and it has never shown anything like so good a record as eilver mining, and yet people will content themselves with a much smaller return upon their investments.

Printed Words Vitiate an Olographic Will.—W. E. Milford wrote a will which douhtless he firmly believed would etand the strongest test; but, as the law in this State provides that an olographic will must he wholly in the handwriting nf the testator, and as, unfortunately, in the will in question, the date line was printed, Jndge Finn was compelled to declare the document invslid. It was consequently fnnnd necessary to fall hack npon a former will executed at Parie some years ago. The executors of the will, one of whom is at Paris and the other Rio Janeiro, have sent by cable a rennnciation of their trust, snd letters testamentary, with the wills annexed, have been granted to the widow.

The St. Gothard Railroad.—An important undertaking has been suggested hy the opening of the St. Gothard railroad. It is proposed to connect the Adriatic with the Lsgo Maggiore hy a system of canals, of which the terminal will hs at Venice and Magadino. This project presents neitber financial nor enginesring difficulties, and it will probahly he actually accomplished.

A New Tunnel at Cherokee.

About two weeks since, the Spring Valley company at Cherokee hsgan to wssh through their new tunnel. On the 13th day of Msrch, one year ago, the first drill was started upon thst work. It is 10x10 ft. in the clear, and over 3,000 ft. long. The mouth of the tunnel is located at a point in Sawmill ravine, just below the crossing of the Miocene ditch. The tunnel was driven from five different places. At a distance of 1,804 ft. from the mouth of the tunnel a shaft was snnk to a depth of 140 ft., and the tunnel driven in both directions. At another point, 2,963 ft. from the mouth, another shaft was put down 104 ft. deep, and work was also begun bere in both directions. The upper end of the tunnel is 96 ft. below the surface of tbe worked ground in Sawmill ravine, and 41 ft. in the hedrock—the gravel at this point being 55 ft. deep, as determined hy shaft. The grade of the tunnel is 6 inches in 16 feet. While driving the tunnel, there wero placed at each shaft hoisting gear and a safety cage, rnn hy a Knight water-wheel. At each shaft was an air compressor of sufficient capacity to drive four drills and a pump—each compressor heing driven by a Knight wheel; and at the mouth of the tunnel was a smaller compressor, with sufficient capacity to drive two drills. To accomplish this work there wers in use ten three-inch Ingarsoll "Eclipse" drills—two in each header. Thsrs are now two flumes laid through ths entire length of the tnnnel—one five feet wide. and the other of smaller size. The accomplishment of this work in so short a time is certainly remarkahle, and is no donht largely due to the faultless manner in which the engineering work was done. So nicely adjusted were the instruments of precision used, so carefully were the measurements taken, and so accurately were the calculations made, that at each connecting point the alignment was perfect; and in making one of the connections tbe two approaching drills collided in driving tbe final holes that broke through.—*Oroville Mercury.*

Quarterly Coinage Statement.

The coinsge of the four United States mints for tbe month of March embraced 1,211,400 gold pieces, 2,302,000 silver pieces snd 2,815,300 nickel pieces. The total was 7,328,700 pieces of a value of $12,009,024. This is the largest amount of coin turned out hy the mints in a long time, if not the largeet amount ever made during a single month. Tbe coinage of douhle eagles last month, tbough comparatively small, was actually larger than the combined amount for the previous two months. Eagles led last month in the gold coinage. All descriptions of coins now made hy the Government, with tbe exception of tbe lowest three gold pieces, were executed last month. In February the whole list wae represented for the first time in about a year. Following is a ststement of the coinage of all the United States mints for March and for the quarter ending March 31, 1882:

	March.	Quarter.
Double eagles	$1,040,000	$1,986,500
Eagles	5,608,000	10,580,750
Half eagles	2,993,000	11,808,925
Quarter eagles	.....	63
Three dollars	.....	75
Dollars	.....	25
Standard dollars	2,300,500	6,900,500
Half dollars	250	350
Quarter dollars	125	175
Dimes	50	70
Five cents	30,155	112,200
Three cents	33	53
Cents	30,911	118,018
Totals	$12,009,024	$31,507,794

This amount ie nearly as large as the coinage for 12 months a few years ago. The numher of half oagles coined for the past quarter is prohably larger than for any previous quarter. For general use this is the most convenient of all the gold coins, though in sections where metallic money is the dominant currency, as in Californis, bankers show a strong dislike to the multiplication of half eagles.

Mining Dividends for the Quarter.—The mining industry in some sections is not as prosperous as in former years. Tbe great Comstock lode is under a cloud, and has been for some time. It is nearly two years since the last dividend was received from that section. Of course, when such a prominent district drope out of the dividend list, it ie natural to feel thst everything in the mining line is doing poorly. Of late years a good deal of mining capital has heen absorhed at the East in the organization of mines in Utah, Arizona, Dakota and Colorado. This also has diverted attention from the profite of the business. It is no secret that California hss lost the control of most of the active dividend mines of the day. There is still a large interest here in the Comstock mines, hut it is not very attractive just now, and derives its only prominence frnm the assessment notices. The New York *Mining Record* has compiled a statement of the mining dividends for the quarter ending March 31st, the dishursements of which it apportions as follows.

At New York	$1,994 375
At Boston	893,750
At San Francisco	680 250
At Philadelphia	150,000
At London	135,000
Elsewhere	205,512
Total	$4,069,887

The above dividends have come from 41 mines, and others probably have heen unintentionally omitted.

MECHANICAL PROGRESS.

Bursting Saws.

A correspondent from Turnwood, N. Y., writing to Leffel's *Mechanical News*, takes up the subject of bursting saws:

The intense vibration of circular saws weakens them, but I do not know that they burst from long usage as much as from bad usage. In my opinion it is the latter. No tool gets such hard usage as the circular saw, and more saws are spoiled by hard usage than by all other causes put together.

In breaking a piece of cast steel, file a sharp corner in it, and when you strike it with a hammer it will break where it has been filed. Now if we file such a sharp corner at the bottom of the saw-tooth gullet or dust chamber, and the saw is not round, there will be an undue strain put on that portion of the saw where the teeth are longest, and by continued use it must break. Now if a saw has a crack in the plate, and we drill a hole at the bottom of the crack, it will prevent its cracking any farther. Suppose we had put that hole in the gullet, ten chances to one the saw would not have cracked at all. It will be seen that a saw that is out of round, with sharp corners at the roots of each tooth, is liable to fly to pieces at any instant, when the saw comes in contact with hard knots, long spikes, and pieces of drive hook broken off in the log.

Again, heating spoils saws. Some sawyers will run a saw until it is tremendously hot, and, to make it worse, they throw cold water on the side, thus causing sudden contraction on that part of the saw, and after a few such times the saw has to go to the factory to be hammered and put in order, and to come back to meet the same fate as before.

If the saw is round, hangs true in mandrel, is in line with the carriage, filed square at top and bottom, the backs of the teeth lower than the points, with the required amount of spread set, and the teeth kept well chamfered with a gummer, so that when the saw runs, only the points will come in contact with the lumber, then a saw will run free and cool, and there will be no extra strain on the plate, no heating, nor danger. The causes of bursting of saws, in my opinion, are:

1. Square corners at bottom of tooth.

2. Out of round, with the backs higher than the points, so that instead of cutting, they scrape the dust off with the back.

3. Undue strain put upon the saw by the plate rubbing against the log, causing it to heat, which takes the life out of a circular saw.

Where inserted teeth saws are used, and the power is light, every other tooth may be taken out, and a worn out tooth put in to protect the jaw. Mills with less than 20 horse-power, if the saw is put in good order, will cut 1,000 ft. more per day with every other tooth out than with the full set. Each tooth will take out one-eighth inch almost as easily as one-sixteenth—that is, a 16 horse-power will do with a half set nearly as much as a 20 horse-power will do with a full set of teeth. I have run saws where each tooth cut a trifle over one-fourth inch, in hemlock. Saws that lap over into the log when in line with the carriage want more set; saws are very apt to lay to the log when the set is out, especially on heavy feed.

Mechanical Terms.

The technical terms which are in use do not seem to be generally comprehended by the majority of our mechanics and engineers, from the fact that a large number of terms are in use which mean one and the same thing. The distinction particularly between the terms force, power and work is not clearly understood. Dynamics is the science of that branch of mechanics which treats of force in motion, power and work. It comprehends the action of all kinds of machinery, manual and animal labor, in transformation of physical work. Element is an essential principle which cannot be resolved into two or more different principles. The simple physical elements of dynamics are force, velocity and time; and the functions of those elements are power, space and work. Function is any compound result or product of two or more elements. A function is resolved by dividing it with one or more of its elements. Force is any action which can be expressed simply by weight, and which can be realized only by an equal amount of reaction, and is the first element in dynamics. All bodies in nature possess the inherent virtues of repelling and attracting one another, which action is recognized as force. Velocity is speed or rate of motion, and is the second element in dynamics. Time implies a continuous perception, recognized as duration, or that measured by a clock, and is the third element in dynamics. Power is the product of force and velocity; that is to say, a force multiplied by the velocity with which it is acting is the power in operation. Power is the differential of work or any action which produces work, whether mental or physical. Power multiplied by the time of action is work—work divided by time is power. Work is the product obtained by multiplying together the three simple elements, force, velocity and time.—*American Machinist.*

On the Dimensions of Cast Iron at Various Temperatures.

At a recent meeting of the Royal Society of Edinburgh, Prof. P. G. Tait communicated a paper by W. J. Millar, C. E., Glasgow, which was a detailed description of a series of experiments made by the author on the dimensions of cast iron and other metals at various temperatures, and more especially with reference to the phenomena of floating cast iron. It was pointed out by the author that various views have been held as to phenomena attending cast iron at extreme temperatures, as in the molten state, white-hot solid, and finally, the cooled solid condition. From experiments made by the author some years ago, he concluded that the cause of flotation was buoyancy derived from the expension which was due to the great heat of the molten mass in which the cold piece of metal was suddenly placed, inasmuch as the pieces, especially when large and heavy, disappeared beneath the surface, and thereafter rose and floated upon it. He found his views to be confirmed by the results of a series of experiments which he had recently carried out. By making careful measurements of the solid pieces of metal both before and after immersion, he had found that a large expansion took place, the amount of which was about equal to the whole of the original shrinkage from the molten to the finally cooling solid state. He had also observed that in every case the floating metal was at a comparatively low temperature. For example, a piece of cast iron 12 inches long was found to float after an immersion of a few seconds, when it was at once taken out and its length found to be 12⅛ inches, even though its own temperature was barely equal to that of the melting point of lead. The author had, therefore, formed the opinion that a large portion of the heat disappeared in the form of work of extension. By using pieces of lead, type metal, steel and bronze, in other experiments, he observed that the lead and type metal did not float, and that the other two bodies behaved in the same way as cast iron. Then, again, he instituted a series of experiments with the view of determining whether or not any expansion resulted during the solidifying of cast iron; but from the results which he obtained it seemed to be very doubtful if any such action took place, at least if the metal of the casting were not permeated by any air or other gaseous matter. In all cases, the author found that the results of his experiments corresponded exactly with the conclusion which he had based on those which he had instituted a number of years ago.

EXPANSION OF STEEL IN HARDENING.—It is well known to workers of steel that by the process of hardening it is sometimes expanded, so that in a job where two pieces are fitted accurately in their unhardened state they become so much enlarged that grinding is necessary to restore them to their former relative size. No rule has yet been found by which the amount of this expension can be actually determined before hardening. It may depend upon the amount of carbon in the steel, which varies in different specimens; on the degree of heat employed in the process, and also largely on the size and shape of the pieces treated. This expansion may, however, be reduced to the minimum by repeated annealings while the work is in progress at the lathe, vice or planer. It is also true that in some instances steel, having been hardened, will contract slightly when drawn to temper, the amount of contraction depending on the lowness of drawing.

THE HOLLAND PROCESS for using petroleum for fuel has had another, and apperently a more satisfactory test in public after a long period of silence. The new locomotive built at the Grant works for the especial purpose was used, and it is stated that "the experiment demonstrated the capacity of the process to get up sufficient heat for the ordinary locomotive within 12 to 15 minutes, and showed that this heat was under such command that a child could regulate the opening, closing and intensity." The process consists in uniting naphtha and water by means of an oxy-hydrogen blow-pipe so that the water itself becomes fuel. Great economy and absence of smoke and ash are among the evident advantages of this discovery, if its practicability shall be established.—*Railway Age.*

SOFTENING CAST IRON.—The surface of cast iron may be softened for turning or planing by immersion for 24 hours in a solution of one part aquafortis to four of water.

SOAPSTONE AND FERTILITY.—At the meeting of the Academy of Sciences on Monday evening, a large piece of soapstone from Elko, Nev., was also exhibited, and it was explained that the analysis of a Miss Ara Sessions of the University proved the mineral to be an essentially aluminum magnesium silicate. An extraordinary property of the soapstone is that it becomes of a gelatinous character upon the addition of water, and while it swells by such application, no amount of water can dissolve it. Prof. Hilgard had discovered the mineral in Mississippi, and ascribed the fertility of the land to the water-absorbing quality of the soapstone, in turn to be abstracted by the plant. In the manufacture of soap the mineral also makes a ready combination with water, and, unlike talc, leaves no precipitate, or at least an inconsiderable one of only 5%.

SCIENTIFIC PROGRESS.

Another Important Chemical Triumph.

Among the wonders of modern chemistry none are more striking than those which its magical touch has created from coal tar. Among the most important commercial products from so unpromising a source as coal tar would at first seem to be, have been carbolic acid, picric acid, paraffine, all the aniline dyes, artificial madder, artificial indigo, and a great variety of coloring matters in addition to those mentioned. Within the last year some reference has been made in public journals to the fact that a German chemist had succeeded in making a substance very strongly resembling quinine, by a process in which some of the elements of coal tar were employed. The body known as quinine, which is yielded by quinic acid, was obtained as long ago as 1861 from anthracine, a body which occurs in coal tar. The idea of manufacturing an artificial quinine by the use of coal tar has in late years, therefore, been familiar to chemists, and has been the cause of many experiments. The success of these efforts would be so very important a matter, and the public references to the alleged achievement had been so brief and vague, that a reporter of the N. Y. *Evening Post* recently applied for information on the subject to President Henry Morton, of the Stevens Institute of Technology, who was known to have given it much attention.

Prof. Morton said that artificial quinine had not yet been manufactured artificially, but that an artificial chinoline had been produced so much like the drug of commerce, that many persons believed it to be the medicinal equivalent of quinine. If it did not prove to be fully that, there could be no doubt that the progress thus made would be advanced till it produced quinine itself. By a process of destructive distillation, chinoline could be obtained from quinine, and, with the resources of modern chemistry, it was certain that this result could be reversed. The inventor of the artificial chinoline in question was Prof. Skraup, of the University of Vienna. Prof. Skraup had not made his discovery by accident, but by the intelligent use of means to that precise end. The invention was the result of experiments based on a system of reasoning in accordance with the modern theory of chemistry in regard to the structure and arrangement of atoms. The artificial chinoline was not *extracted* from coal tar, but was *constructed* from certain elements, some of which were derived from that substance. It was obtained by the action of a mixture of glycerine and sulphuric acid upon a mixture of nitro-benzole and aniline.

Prof. Morton said that he had manufactured the artificial chinoline in his own laboratory, a few ounces at a time, until he had produced probably some three pounds in all. He had succeeded in making some minor improvements in the process, as, for instance, in the purification.

A number of experiments to test the medicinal qualities of the new product have been made in Russia by Dr. Donath, upon both men and animals; but he was unable to try it in fevers, owing to a lack of patients. It is reported that in Germany a number of cases of intermittent fevers have been successfully treated with chinoline, but these statements have not been verified, and are not generally accepted by the medical profession. Experiments with the new substance have also been made by physicians in New York, but the quantities of it manufactured there, or received from abroad, have thus far been so small that it has not been possible to make tests of a conclusive character. It has been proved, however, that the artificial chinoline, when administered medicinally, had the effect of lowering the temperature, as quinine has, and that, like quinine, it is a powerful antiseptic.

In speaking of the great variety of products obtained directly or indirectly from coal tar, Prof. Morton remarked that, in addition to the important commercial products thus derived, "almost everything" had been made from it as a chemical curiosity. Even the flavor of vanilla had been secured from coal tar, but this was much more costly than the natural product of the vanilla bean. The first cost of artificial indigo, was greater than that of natural indigo, but the artificial product was, nevertheless, more economical for calico printing, as it could be printed directly on the cloth, while with the natural dye an elaborate and wasteful process was required. Consequently, the artificial indigo was now used at the rate of 500 lbs. a week at some of the large print works in this country, although its manufacture was still confined to Europe.

When asked as to the probable supply and cost of artificial chinoline, in case it should be proved the medicinal equivalent of quinine, Prof. Morton replied that it could easily be manufactured in great quantities at large works erected for that purpose, and that the actual cost of its production need not exceed one dollar per pound. Inasmuch as quinine had been sold at four or five dollars an ounce, and the supply of Peruvian bark was diminishing, the great importance of a cheap, inexhaustible substitute was apparent.

WAVE LENGTHS of the sounds emitted by a man's voice in ordinary conversation are from 8 ft. to 12 ft., and that of a woman's voice 2 ft. to 4 ft. per second.

Congenital Color-Blindness.

It is my belief that a large number, perhaps a majority, of the cases of congenital color-blindness have not their seat in the retina at all, but are cerebral in their character. In other words, I believe that in these cases the brain-center of vision has not the power to differentiate the various impressions it receives. This opinion will seem the more plausible when we remember that the sense of sight is a developed or educated one. Though we have received from our ancestors the potentiality of vision, every child that is born must learn to see for itself. Without here entering into a discussion of the question of the development of the color-sense, which has received much attention at the hands of Mr. Gladstone, Magnus, and others, it is safe to assume, with our knowledge of analogous matters, that the differentiation of colors is a power partly inherited and partly developed in the individual; and, moreover, we should expect to find this power, which is cerebral in its character, most strongly developed where the faculty was most used. And so we do find it. Women, who are much more concerned than men in the selection and comparison of colors, are rarely affected with color-blindness; and we all know how much quicker the feminine eye is in detecting slight differences in shades of color than is that of men who are not color-blind. In those cases of color-blindness which, for the sake of distinction, we shall call central, we believe that the brain-center of vision has not been developed to its full or at least to its ordinary power for discriminating between the impressions corresponding to the different colors. The retina may be capable of properly responding to these various impressions, and the optic nerve may carry them as separate impressions to the brain-center, but this has not the power of converting them into individual sensations.—*Popular Science.*

HOW ODORS ARE PROPAGATED.—According to this view, the odoriferous bodies, or their molecules, have no more to do (in the sense of physical impact) in producing the sensation of smell, than a luminous body—a candle or the sun—has to do (by impact) with the sensation of light. There is corporeal impact or touch in neither case. Of course, with each molecule as a center of activity, the effect will be more pronounced at the immediate surface (as with all radiant energies) than at any distance. And, undoubtedly, particles of disintegrating, odorous matter are often brought in contact with the Schneiderian membrane; but the sensation of that impact, if there be any, would be of touch, not of smell, as surely as that, from that point of contact to the sensorium, the effect or influence is conveyed by a vibration—a wave-motion in the "fluid" of the nerve-duct—as the undulations of the luminiferous ether are propagated along the course of the optic nerve to the seat of sensation, where they are translated into light and color. But, if, for any portion of the distance between the internal sense and the fragrant body, the odor, like light, is but a motion, it is safe to assume it for all. The analogy of this mode of odors to that of light and sound, is something in its favor.—*Popular Science Monthly.*

EARTHQUAKES.—Dr. K. von Fritsch, of Halle, maintains that the causes of earthquakes are much slighter than has generally been believed; that they may be sought at a depth of not more than 10 or 15 miles, and often of less, and that rather feeble forces may produce earthquakes which will be felt at great distances. The hammer in Krupp's factory, which weighs 1,000 centners, and falls from a hight of 10 ft., produces sensible concussions over a surface five miles in diameter; and a recent explosion in a dynamite factory was felt at between 25 and 30 miles away. Dr. Fritsch points out how earthquakes might and must be produced by the increase and decrease in volume of rocks under the influence of physical and chemical forces, by concussions, by the opening of crevices in rocks, and by the subsidence of masses of rocks due to these agencies.

EARTH-TIDES.—A committee of the British Association is investigating the question of the existence of earth-tides, or of oscillations in the crust of the earth similar to those which are produced in the ocean by the attraction of the moon. A pendulum is so suspended that its slightest motion turns a mirror and causes a perceptible movement in the spot of light reflected by it upon a distant screen. The pendulum is proved to be continually changing its position, for the reflected light is in incessant motion, and so irregular that it is hardly possible to localize its mean position on the screen within five or six inches. Mr. W. Mattieu Williams has suggested that the constant movements of the microscopic bubbles imprisoned within the cavities of gems and minerals are due to the same cause.

UNCONSCIOUS NERVE FORCE.—In his "Diseases of Memory," Ribot says: "When a child learns to write, according to Lewes, it is impossible for him to use his hand alone; he must also move his tongue, the facial muscles, and perhaps his feet. In time he is able to suppress these useless discharges of nerve force. And so, when we attempt for the first time any muscular act, we expend a great quantity of superfluous energy which we learn gradually to subdue. By exercise certain movements are fixed, to the exclusion of others."

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Apr. 13		Week Ending Apr. 20		Week Ending Apr. 27		Week Ending May 4.	
Alpha	75c	45c	1.15	50c	1.10	90c	1.15	1
Alta	3.40	2.60	3.40	2.55	2.55	2.05	2½	1.95
Andes	85c	55c	80c	75c	70c	60c	70c	65c
Albion	2.95	2	2½	2.10	2.15	2.05	2.15	2.05
Argenta	10c	5c	5c	....	5c	....	....	....
Addeuda	5c	....	....	....	....	....	....	....
Belcher	45c	40c	50c	40c	60c	42c	55c	40c
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	6¾	4.65	6¾	6¼	5¾	5½	5¾	5¼
Bullion	30c	20c	55c	25c	20c	....	40c	20c
Bechtel	25c	....	25c	....	25c	....	30c	....
Belle Isle	....	....	....	....	....	....	....	....
Bodie	5¾	5¼	6	5¼	6	5½	5¾	5¾
Benton	80c	25c	80c	55c	60c	50c	60c	50c
Bulwer	2¼	....	2.20	2.10	....	....	2¼	2.20
Boston	25c	....	....	....	30c	....	30c	20c
Black Hawk	10c	....	10c	....	....	....	10c	....
Belvidere	....	....	....	....	....	....	....	....
Booker	10c	....	....	....	....	....	....	....
Caledonia	....	....	....	....	....	....	....	....
California	20c	10c	15c	10c	10c	5c	30c	25c
Challenge	....	....	....	....	25c	....	25c	20c
Chollar	1.15	85c	1¼	1	85c	75c	85c	75c
Combines	75c	65c	80c	....	80c	75c	80c	....
Con Imperial	....	....	....	....	....	....	....	....
Con Virginia	75c	55c	85c	70c	70c	60c	70c	65c
Crown Point	50c	40c	70c	55c	65c	60c	70c	65c
Columbus	....	....	....	....	....	....	....	....
Champion	....	15c	....	....	....	....	....	....
Concordia	2.25	....	1.30	1¼	1.30	1¼	1¼	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	25c	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	1.90	1.70	1.85	1.65	1¾	1.60	1.60	1.65
E Mt. Diablo	15c	....	10c	10c	10c	....	10c	....
Eureka Con	22½	21¾	22¼	21½	24	22½	22¾	21¼
Exchequer	30c	20c	35c	25c	30c	25c	25c	....
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	40c	35c	40c	35c	40c	....	50c	45c
Gould & Curry	3.45	2¼	3.35	3.15	3.05	2.70	2.85	2.35
Hale & Norcross	1.40	75c	2.10	1.05	1.60	1.40	1.55	1.30
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	15c	....	....	....
Julia	....	....	20c	15c	15c	....	....	....
Justice	1.05	45c	75c	60c	55c	45c	55c	40c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	....	....	....	25c	....	40c	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	10c	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	1¼	....	1¼	....
Martin White	4	....	3¾	4.30	4¼	4¼	4	....
McClinton	....	....	....	....	....	....	....	....
Mono	1¾	1.45	1.80	1.40	1¾	1¼	1.60	1.35
Mexican	9	5	8¾	8	9¼	7¾	8¼	7¾
Mt. Diablo	4¾	4.55	4½	....	4	3¾	4¼	4
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	1.20	1	1.15	1.10	1¼	90c	1.05	1
New York	....	....	....	....	15c	....	....	....
Northern Belle	8¼	8¾	8	7¾	7¾	7¾	8	....
North Noonday	....	....	1	95c	1	....	1	90c
Navajo	95c	90c	1.10	....	1.30	1.15	1.55	1.35
Occidental	1	80c	1	....	1	....	95c	....
Ophir	6	3.05	4.65	4.20	4.60	3¾	4¼	3.70
Original Keystone	....	....	....	....	....	....	....	....
Overman	30c	20c	30c	25c	25c	20c	25c	10c
Oro	50c	30c	35c	30c	35c	30c	30c	25c
Paris	....	....	....	....	....	....	....	....
Potosi	1	75c	90c	85c	80c	65c	70c	50c
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	2	1.20	2.40	1.90	1.80	1¼	1.55	1¼
Seg Belcher	1¼	....	1¾	....	2.30	2	2¼	....
Sierra Nevada	9¼	8	9¾	7¾	9¼	6¾	9¼	8¼
Silver Hill	20c	10c	20c	15c	....	....	....	....
Silver King	17	16¾	17¼	16¾	17	....	17¾	17¼
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	20c	....	20c	....	....
Scorpion	75c	70c	1	90c	1	80c	1	85c
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	30c	....	30c	....	30c	20c	....	....
Tioga Con	20c	....	25c	20c	20c	....	25c	....
Tiptop	3.60	2.80	4¼	4	4	....	....	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	17¼	7¾	13¾	11½	15¼	12¾	14¾	12
Utah	6¼	3.15	5¾	5	5¾	4.65	5	4¼
Ward	3¼	....	3¾	....	3¾	....	....	....
Wales	60c	55c	55c	....	55c	45c	50c	....
Yellow Jacket	1.15	95c	1.10	1.05	1¼	1	1¼	1.15

Sales at S. F. Stock Exchange.

Thursday A. M., May 4.

240	Scorpion		90@85c
495	Alta	2¼@2.10	2475 Union 12¾@13
100	Andes	70c	20 Utah 4¼
200	B & Belcher	5¾@5¼	660 Yellow Jacket 1.15@1.20
200	Belcher	40c	
350	Bullion	35@25c	AFTERNOON SESSION.
180	Benton	60c	75 Albion 2.10
100	California	25c	50 Bodie 5¾
310	Con Virginia	60@65c	725 Day 1¾@1.80
360	Chollar	70@75c	250 Eureka Tunnel 90c
40	Confidence	80c	120 E Mt Diablo 10c
50	Challenge	25c	15 Manhattan 1.15
60	Gould & Curry	2.45	50 Mt Diablo 4
900	Hale & Nor	1.30@1.35	130 Mono 1.40@1¾
100	Justice	45c	220 M White 3.85@3.80
250	Mexican	7¼@7¾	300 N Noonday 90c
330	Ophir	3.90	70 Northern Belle 8¾
100	Overman	15c	100 Navajo 1.30
520	Potosi	50@55c	500 Oro 30c
1370	Savage	1¼@1.30	100 Pinal 2¼
110	Sierra Nevada	8¾@8¼	90 Southern Nev 6¾@6¾

Meetings and Elections.

Black Bear Quartz M. Co., May 1. Trustees—Thomas Bell (President), S. Heydenfeldt (Vice-President), Alpheus Bull, F. Locan, J. Daggett; Wm. Letts Oliver, Secretary.

Justice M. Co., May 1. Trustees—J. P. Cavallier (President), H. M. Levy (Vice-President), John Scott Wilson, W. Ayer, P. Ameraux; R. E. Kelly, Secretary; Bank of California, Treasurer.

Woodville M. Co., May 1. Trustees—J. P. Cava'lier (President), H. M Levy (Vice-President), John Scott Wilson, W. Ayer, P. Ameraux; R. E. Kelly, Secretary; Bank of California, Treasurer.

Buckeye Hydraulic M. Co., May 1. Trustees—J. K. Holman (President), Wm. A. Stephens (Vice-President), W. Bayard Cutting, James Heron, Henry Wadsworth.

Utah Extension M. Co., May 1. Trustees—J. Meyers (President), V. Ressayre (Vice-President), C. H. Redmond, J. H. Kavanagh, S. V. Hendenreich.

THE French and Englisb are getting hold of the good mines. The Enreka *Sentinel* says: The Phenix mine has been bonded to a French company in San Francisco, the agent of which will arrive here in a few days to examine the propsrty, and will probably buy it for his principals. The mine is now being worked under lease. The Phenix is situated between the K K and Jackson, on Ruby hill. It is one of the oldest locations, and was at one time one of the best paying mines in the district. It has fine hoisting works on the ground, and has been prospected to a depth of 630 ft.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	16	50	Mar 20	Apr 26	May 19	Wm Willis	309 Montgomery st
Argenta M & M Co	Nevada	10	10	Apr 12	May 19	June 12	E M Hall	3.7 Pine s
Alta S M Co	Nevada	23	50	May 2	June 6	June 27	W H Watson	302 Montgomery st
Belcher S M Co	Nevada	30	25	Apr 14	May 17	June 5	J Crockett	327 Pine st
Belmont M Co	Nevada	31	15	Mar 11	Apr 17	May 15	J W Pew	310 Pine st
Belvidere M Co	California	13	25	Feb 9	Apr 12	June 8	C V D Hubbard	310 Pine st
Best & Belcher M Co	Nevada	23	50	Apr 5	May 11	June 2	Wm Willis	309 Montgomery st
Bullion M & M Co	Nevada	23	30	Mar 20	May 2	May 24	J M Brazell	328 Montgomery st
California M Co	Nevada	3	20	Mar 29	May 6	June 5	C F Gordon	309 Montgomery st
Fair Villa M Co	Arizona	1	21	Apr 24	May 29	June 19	J H Sayre	330 Pine st
Goodshaw M Co	California	10	10	Mar 21	Apr 22	May	C C Harvey	339 Montgomery st
Hale & Norcross S M Co	Nevada	73	50	Mar 14	Apr 19	May 10	J F Lightner	309 Montgomery st
Iowa M Co	Nevada	16	03	Mar 8	Apr 15	May 6	C C Leavitt	411½ California st
Mexican G M Co	Nevada	15	1 00	Mar 13	Apr 15	May 9	C L McCoy	309 Montgomery st
Napoleon M Co	California	8	5	Apr 20	May 22	June 8	H Smith	307 Montgomery st
Navajo M Co	Nevada	10	20	Mar 7	Apr 27	May 22	J W Pew	310 Pine st
New Coso M Co	California	13	10	Mar 30	May 1	May 22	D B Chisholm	327 Pine st
Niagara G & S M Co	Nevada	6	20	Apr 1	May 3	May 25	O C Miller	409 Montgomery st
North Gould & Curry G & S M Co	Nevada	2	20	Mar 18	Apr 19	May 11	C H Mason	331 Montgomery st
Pinal Con M Co	Arizona	3	30	Apr 3	May 8	May 23	W W Traylor	309 Montgomery st
Potosi M & M Co	Nevada	4	5	Apr 12	May 16	June 6	W E Horan	309 Montgomery st
Quartz Moutain M Co	California	14	75	Mar 16	Apr 24	May 24	E Hestres	729 Montgomery st
Sierra Nevada S M Co	Nevada	72	1 00	Mar 23	Apr 26	May 15	E L Parker	309 Montgomery st
Silver Lick Con M Co	Nevada	1	05	Mar 29	May 6	May 27	L J O'Farrell	Montgomery Block
Silver Belt M Co	Arizona	1	15	Mar 8	Apr 17	May 15	J W Pew	310 Pine st
Silver Hill G M Co	California	2	25	Apr 12	June 10	July 10	J W Pew	310 Pine st
Star M & M Co	Nevada	10	10	Mar 22	Apr 22	May 15	Wm Stuart	320 Sansome st
Tellurium G & S M Co	California	26	10	Apr 1	May 5	May 24	H P Bush	431 California st
Union Con S M Co	Nevada	19	1 00	Mar 21	Apr 25	May 15	J M Buffington	309 Montgomery st
Villagrana M Co	Lower California	1	20	Apr 25	June 26	July 15	A Judson	320 Sansome st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Arizona-Utah M Co	Arizona	2	01	Mar 7	Apr 21	May 12	N C Carnall	320 Sansome st
Caledonia M & M Co	Nevada	12	25	Apr 5	May 18	June 15	W Letts Oliver	323 Montgomery st
Equator M Co	—	—	20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Golden Fleece Grav M Co	California	25	30 00	Apr 15	May 20	June 8	F Schirmier	7s5 Folsom st
Holmes M Co	—	4	10	Apr 4	May 8	May 24	E A Holmes	318 Pine st
Lima Con M Co	—	1	05	Mar 31	May 5	May 31	R D Hopkins	436 Montgomery st
Metallic M Co	—	—	20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Metallic-Equator M Co	—	—	20	Feb 27	Apr 11	May 9	Wm Willis	309 Montgomery st
Monumental Tunnel M Co	California	2	05	Mar 31	May 3	May 22	D B Chisholm	327 Pine st
Mt Auburn M Co	California	7	10	Mar 11	Apr 11	May 11	J T Newell	330 Pine st
Peabody M Co	Nevada	4	05	Feb 25	Apr 10	Apr 29	R D Hopkins	436 Montgomery st
Santa Amnita M & M Co	California	3	03	Apr 17	May 22	June 12	J M Buffington	309 California st
South Bodie M Co	California	6	15	Mar 27	May 2	May 25	Henry Deas	309 Montgomery st
Tower Con M Co	Nevada	1	10	Apr 7	May 12	June 1	G W Sessions	309 Montgomery st
Wide Awake P & M Co	Arizona	16	10	Mar 17	Apr 23	May 25	C Hilderbrandte	cor Bush & Kearny
Western Home M Co	—	3	05	Apr 10	May 11	June 15	A Halsey	323 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Atlas M Co	—	L Berger	327 Pine st	Special	May 6
Maryland Con M Co	—	E P Farnsworth	219 Sansome st	Annual	May 6
Morgan M Co	Nevada	C L Tilden	533 Kearny st	Annual	May 6
Mt Potosi M Co	Nevada	J H Sayre	330 Pine st	Special	Apr 29

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	May 12
Contention M Co		D C Bates	309 Montgomery st	25	Feb 28
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	Apr 27
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Apr 11
Silver King M Co	Arizona	J Nash	315 California st	25	Apr 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	May 12

The Mining Share Market.

There has been a little spurt this week in Union Con., hnt small variations are the rule.

The following mining companies had cash on hand May 1st: Alta, $8,739.40; Alpha, $11,-924.46; Argenta, $210.28; Benton, $11,231.11; Bnlwer, $77,895 15; Bechtel, $970.71; Bodie, $65,207.01; Crown Point, $21,922.85; Chollar, $5,939.24; Exchequer, $9,652.42; Gould & Curry, $948.72; Grand Prize, $186.31; Hale & Norcross, $10,340.01; Justice, $6,900.57; Lady Washington, $1,688.75; Mexican, $15,804; Mono, $5,183.74; Northern Belle, $29,613.73; Ophir, $39,145; Potosi, $2,488.78; Sierra Nevada, $23,620.74; Standard, $241,008.41; Tioga, $6,161.21; Utah, $2,-641.91; Union, $35,088.37; Yellow Jacket, $80,-000; Belding, $506.76; Con. Virginia, $83 752; East Monnt Diahlo, $3,096.36; General Jackson, $3,713.93; Metallic Eqnator, $1,648.75; Mount Diahlo, $56,170.21; Saratoga, $7,524.33.

The following companies had an indebtedness May 1st: Belcher, 25.000; Best & Belcher, $21,422.67; Belle Isle, $299 93; California, $50,-000; Day, $89,000.77; N. B. Isle, $708.06; Savage, $30,516.44. May 2d: Betty O'Neal, $16,-391.03; Holmes, $1,919.78.

It is hoped that work will at once be commenced looking tn the draining of the flooded mines. Meantime some ore is being extracted from the upper levels hy the Belcher and Crown Point companies and the Yellow Jacket folks are about to begin the extraction of ore from the old upper levels, working through the old shaft at Gold Mill.

The ore stopes on the 2500 level of the Union Consolidated are yielding well, says the *Enterprise*, and the ore is improving in quality. The pulp assays have advanced from above $45 to $70 per ton. The winze has been snnk some 30 ft. below the sill floors of the 2500 stopes, and is still in fine ore. This shows the ore body to be of large eize. The ore deposit is widening toward the southwest, and is also improving in quality in that direction. On the 2600 level the northwest drift is still advancing in a promising vein formation. It will soon reach the point where it is expected that ore will be found. In sinking No. 1 winze (the wet winze) below the 2600 level some good seams of ore are being encountered. It is going down on an incline.

COLORADO IRON WORKS.—These works, at Denver, sent us an advertisement, which appears in another column, hnt our compositor gave them a wider scope than they claimed. They wrote, "the oldest and largest manufactory in the West," and the said typo makes them say "in the world." The page was printed before our attention was called to it. The works are old and large, hut not quite what was said about them. The proprietors are modest, if they are Colorado men, and we make this apology for them.

THE carpenters of Cincinnati have struck for 50 cents extra a day, and building has stopped.

Bullion Shipments.

We quote shipments siuce our last, and shall be pleased to receive further reports:

Northern Belle, April 24th, $4,009; Mt. Diablo, 26th, $16,127; Christy, 27th, $4,798; Standard, 25th, $25,420; Eureka Con., 22d, $22,501; Tiptop (for March), $23,576; Contention, April 27th, $10,992; Bodie, 30th, $10 873; Northern Belle, 27th, $5,645; Belle Isle, 30th, $4,000; North Belle Isle, 30th, $2,000; Christy, 29th, $4 373; Bodie Tunnel, May 2d, $3,583; Contention, 2d, $19,484; Horn Silver, April 26th, $22,500; Frisco, 25th, $5,038; Barbee & Walker, 25th, $1,067; Horn Silver, 27th, $15,-000; Copper Balt, 27th, $766; Horn Silver, 28th, $10,000; Stormont, 28th, $3,250; Crismon, 28th, $832; Horn Silver, 29th, 12,500; Frisco, 29th, $5,045; Horn Silver, 30.h, $7,500; Alice (for April), $90,000.

THE LATEST RUSH.—W. D. Knight, of the Yellowstone *Journal*, who recently returned from Maginnis to Miles City, gives a glowing account of the new mining district. He states that the placer diggings are worked every day, and will rnn $40 to the man in gold. Most of the quartz mines are silver, hut of a very high grade, averaging from $3,000 to $12,000 to the ton and free-milling. The gold quartz has not opened very extensively yet, but enough to know its true valne. The best developed mines are the Chollar and Montana, both of which now have over $100,000 on the dump awaiting machinery. The principal town is Maiden, sit uated at the head of Warm Spring creek, about four miles from Fort Maginnis, and town lots have advanced in valne from $50 to $1,500 within the past two or three weeks. There are now in the place abont 100 business houses, and enough saloons and other things usually found on the frontier for a city of 20,000 in tho East. They have one good hotel over 100 ft. long, and this and all others are crowded. Carpenters get $5 per day, miners $5 and $6 and common laborers $4 per day.

LIVELY LOCATING AT WOOD RIVER.—Within the past few weeks, that is since the snow began to disappear from the hillsides, a number of promising finds have been made within a short distance of the Keystone city. Some of these show a large vein of ore giving assays of 150 to 250 ozs. silver and 60% to 65% lead to the ton. The greatest share of the claims staked have been east of the town, and on or near a line running from the North Star and Elkhorn across and north of Lake Creek mines. There seems to be one continuons deposit of rich galena along this line, and wherever found is in paying quantity. Prospectors are following up the snow very closely, and the present indications are that a hundred locations will he made along this line during the next 30 days.—*Ketchum Keystone.*

BERTHS on the first-class transatlantic steamers from New York have nearly all been secured up to the 1st of July.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

KELLY.—Amador *Sentinel*, April 29: The mill at the Kelly mine was started up yesterday morning, and works to a charm. We are informed that a party stands ready to contract to work the mine and deliver ore at the mill for 50 cents per ton. We expect to hear of regular bullion shipments from this mine from now on.

CALAVERAS.

RICH GRAVEL.—Calaveras *Citizen*, April 20: Showalter & Hubbard have been at work for the last 3 months on Douglas hill, near town, sinking a shaft near some old diggings, which in former years were exceedingly rich. About a week ago they struck the ledge at a depth of 140 ft, and found a rich body of gravel.

ENTERPRISING.—Calaveras *Chronicle*, April 29: The Cary mine, formerly known as the Gouldson mine, is now in the hands of M. Cary, Esq., a man of energy and enterprise, and hoisting works are to be erected on the mine at once, and the mine worked. Mr. Cary also has the machinery for a portable sawmill, which he intends to run in the timber region in the vicinity of West Point. The greater part of the machinery is already on the ground, and the remainder is now on the way.

ROSE & JENKINS MINE.—We are informed that the Rose & Jenkins mine, at Skull flat, near West Point, is being energetically worked, and with splendid results. A 10-stamp mill has been erected on the mine, and is in operation. The vein of quartz is from 2 to 3 ft in width, and the rock assays all the way from $30 to $100 per ton.

CHAMPION MINE.—Arrangements are being made to prosecute work in this noted mine with renewed vigor. Having reached a depth of 700 ft, the indications at that point are such as to warrant the most sanguine expectations of the owners in the development of a rich, permanent and extensive mine. In sinking to the present depth the pluck and perseverance of the owners have been put severely to the test. The last 250 or 300 ft was through exceedingly hard rock, with no substantial returns for their labor, and very little encouragement. Nothing daunted, however, tho work of sinking continued, and at the depth of 700 ft very encouraging developments were made. Mr. S. Haskins, one of the owners of the mine, from whom we obtain our information, states that the formation from foot to hanging wall is about 70 ft, through which runs a fissure of talcose slate, from 5 to 6 ft in width. From the later developments it appears that the rock extracted all the way down to the present dep h constituted a cross vein through the formation. In sinking a winze, a new chute of ore was discovered, 3 ft in width. Eight feet to the right of this, on the hanging wall, was found another vein. Both run parallel with the formation, with every indication of coming together at a lower depth and forming the main body. The rock in the one prospects $30 per ton, and in the other $15. It is the belief, and the indications warrant it, that a further depth of 150 or 200 ft will bring the works into a heavy body of ore and the main lead. Some necessary arrangements are being made for carrying on the work to a further depth. As soon as these are completed sinking will be resumed. There are few mines that can show as good a record as the Champion. The owners were in debt when they commenced the work of prospecting, a few years ago, and depended upon the yield of the mine to carry on work. The returns enabled them to clear their indebtedness; erect hoisting works, dig ditches, of which there are 16 or 18 miles; build a sawmill, and pay the expenses of working the mine. We are informed that since the mine first started the yields have aggregated about $100,000.

EL DORADO.

QUARTZ.—Georgetown *Gazette*, April 29: Messrs. Jordan & Zimbro have been energetically prospecting a 12 or 14-inch quartz vein on Slate mountain, some 7 miles southeast of town, during the past 16 months, and from reliable sources we learn they have got a good mine. The rock prospects very evenly for a goodly distance, and is thought to be $15 rock. We learn that the mine is attracting considerable attention from visitors, and that the energetic owners have already put down quite a shaft. A number of others are also reported to be prospecting promising quartz lodes in that neighborhood. A short distance to the southward, T. F. Lewis has a mine which bids fair to become a good property. Much of his quartz pays him fair wages in a spring-pole mortar. Really there is quite a mining boom in that new district. Ten new stamps from the Placerville foundry came up on Smith's stage for the Josephine mine at Volcanoville, and Hi. Fuller took them up this week. Besides the 10 stamps now hammoring away on the Josephine at Volcanoville, active work on several other mines about that camp is going on.

ANOTHER RICH FIND.—*Mountain Democrat*, April 29: One day last week A. S. Bosqui, one of the Grays and the Horn brothers were scouting through the greasewood brush, on Arthur Litten's ranch, in White Oak township, when one of them stumbled over a quartz cropping that showed gold. After a little prospecting they became satisfied that there was considerable more of the same kind ther about. The next morning Archie called on Mr. Litten, and asked him what he would take for 5 acres of that land. Litten didn't care about segregating so small a tract at a less price than $100 an acre. This seemed a pretty steep price for a greasewood tract in White Oak; but Archie had set his heart on it, didn't haggle about the price, and promptly closed a trade for 5 acres at $500. The second day thereafter the young men took out more than the amount of their purchase money, and have opened up a lovely little ledge, a sample from which is before us, thickly studded with free gold, good for at least $150 per ton. It was brought to us by Deputy U. S. Mineral Surveyor J. M. Anderson, who has visited and inspected the ledge, and who fully corroborates all the reports that have been received relative to the richness of the find, as also does E. Cooley, a reliable resident of the vicinity, who has visited our office since the strike was made. Stimulated by this discovery, Mr. Litten has made another, of almost equal value, in the immediate neighborhood.

INYO.

KEARSARGE DISTRICT.—Inyo *Independent*, April 29: The prospects in this district for the present season look very flattering. The strike lately made in the Kearsarge mine has infused new life into this and other properties situated on Kearsarge mountain. The 50 ft. contracted to be sunk from the tunnel in the Kearsarge had not reached 10 ft in depth when a fine vein of ore was exposed. Samples assayed by Mr. Woodhull prove the ore to be first-class milling, carrying both gold and silver. The refitting and necessary repairs to the Kearsarge mill will follow as a natural consequence

MARIPOSA.

DILTZ MINE.—Mariposa *Gazette*, April 29: During the past winter the work upon this mine has been chiefly confined to washing the slate and vein matter upon the surface, which had accumulated from the shafts and tunnels run upon the mine. Water is brought to bear upon the mine by artificial means, and from several sources; but, except it is a rainy season, the reservoirs and ditches must necessarily go dry, and all mining dependent will have to remain undisturbed until a favorable rainy season can be had. Capt. Diltz has only had about 6 weeks' run of water this season; but during the time he has made available the water afforded him, by giving it a chance at his rich bank of dirt and accumulation of matter before mentioned, by sluicing off and sacking the gold, which amount, we understand, runs up into the pounds, and is a sight worth looking at. The 70-ft shaft on the north side of the mine, which had been closed up for the winter, was uncovered last Thurs-

day and examined, was found in an excellent condition, and the timbering intact, as when it was first put in. At the bottom of this shaft is the large vein of pay ore, which will, at no distant day, supply a mill of 40 stamps, and perhaps more.

MONO.

Bodie Con. *Free Press*, May 2: During the past week there were 38 tons of ore hoisted from the mine, of which 46 tons were from the sixth incline level, and 42 tons were from the fifth level; and 115.78 tons were hauled to the mill. The mill crushed 125.02 tons of ore. The average assay value of the pulp was $73.48, and the tailings assayed $7.89. The bullion shipment amounted to $10,873.95. The Lent shaft is 867 ft deep, having been sunk 10 ft during the week. The pumps are making 61 strokes per minute.

Union Con.—The south drift on the Banner lode is now 250 ft in length. The face of the drift shows a heavy deposit of manganese, with clay and quartz, the latter giving average assays of from $16 to $11 in gold, and from 60 cents to $1.25 in silver. About 1 ft of quartz on the west side of the drift is free from waste, and will pay well to mill.

Tioga Con—Upraise No. 1 was advanced during the past week 8 ft; total length, 30 ft. It continues to look well. East crosscut No. 3, from north lateral drift No. 1, is out 250 ft, a progress of 8 ft, with a general improvement in the character and appearance of the formation.

Bodie Tunnel. The ore breasts look well north and south of the tunnel, and yield the usual supply of ore for the mill. The mill is reducing from 33 to 36 tons of ore daily. The bullion shipment will be about $3,400.

Con. Pacific. The north drift on the 130-level was advanced 10 ft during the past week. It is now 236 ft long.

NEVADA.

Notes. *Tidings*, April 28: The O'Connor company is greatly encouraged at the excellent prospects. Two of the tributors have struck the ledge, and the rock taken from it shows well in gold and sulphurets. The ledge is a large one, and considerable rock has been taken out, and is now awaiting the completion of repairs at the mill, when it will be crushed. Work on the mill is not going on as rapidly as it might, on account of a scarcity of lumber. At the Washington, George Mainhart has taken a contract to run 2 drifts, 50 ft each. The company men are still working. The ledge in the north drift is looking much better than it did, and gives good promise. A fan has been added to the Washington, for the purpose of keeping the drifts clear of smoke and supplied with fresh air. The New York Hill mine is looking very favorable, the ledge in the winze being of good size, with good quality of ore. The winze is being put down by day's-pay men. A contract was let yesterday to run the 13 drift a distance of 50 ft. Affairs at the Empire are about the same as when we made our last report. The mine is looking as well as it ever did, and the mill is running night and day on good ore. The Gray Hound Co. is pushing work forward with a vim out on their claim on the north side of Alta hill. The Gray Hound was formerly the Jenny Lind diggings, and was worked with the view of stripping gravel. There is a good quartz ledge on the claim, which will shortly be reached. The Town Talk gravel mine is being worked with energy, and it was expected that gravel would be reached last night. This claim is located at Sutton's ranch, and promises are very favorable. There is an upper tunnel on the property, 550 ft in length, and an incline in this 30 ft in depth, in which a good bed of gravel was struck, but, on account of water, work had to be abandoned in the incline. Another tunnel was run a distance of 700 ft, and an incline 62 ft sunk, from which an upraise is being made to strike the gravel. The Idaho is keeping up its regular lick of turning out gold. The ledge is somewhat improved in quality since our last statements. A new shaft is being sunk on the Ontario mine. Rock in the first shaft became so hard that it could not be worked; hence the new shaft, which is an incline one. The Imperial Co. is still working on Deer creek. The ledge will shortly be cut.

PLUMAS.

Southern Eureka Mine.—Greenville *Bulletin*, April 29: The ore chimney lately struck in the Southern Eureka is opening out into a very fine body of ore. There is an immense body of it, and it works with remarkable ease; with a pick and shovel it can be taken out like gravel. The quartz is all decomposed, and looking in the vein as if it were subjected to some enormous crushing power, and when exposed to the atmosphere it slacks like lime. With the present milling capacity at this mine any further developments are comparatively of little value. A mine that now shows ore enough to supply a sixty stamp mill is kept puttering along with ten stamps. Such one-horse concerns as these are a no injury to the district. If a mill of sufficient capacity were put on the property, and placed below the ditch, every shareholder would receive dividends as regularly as the day came round.

Copper and Silver Mine.—The unexpected is what always happens is as true of mining as of anything else. Some time since several specimens of ore were sent from this office to be assayed for copper. One of the specimens was thought to contain silver, and the assay gave 54 ounces to the ton; this was much greater than was expected. No silver was looked for in ledges at a distance from the first, but this again proves to have been a mistake; the ore that was supposed to have no metal but copper, is found to assay 35½ ounces of silver per ton. This is a complete surprise, as no such result had been expected. About the accuracy of the assay there can be no dispute, as it was made by an authority that would be accepted anywhere without question. The ledges from which the ore was obtained are of great extent and easy of access. There is now an assurance that they will be opened during the coming summer and works erected for reducing the ores.

Indian Valley Mine.—At the Indian Valley mine the new water-power was turned on Monday. Everything worked well till a defective sheet in one of the pipes gave way and caused a temporary stoppage. The defect was easily remedied, and now the mill is running along all right.

Green Mountain Mine. The Orcen Mountain people made a clean-up last week that exceeds in value any made at the mine during a like length of time previously. The large stock of ore now broken out, and the fine condition of the mine, ensures a repetition of the same thing for a long time to come. It is worth mention that the amalgam cleaned up thus far is of greater value than during last year. Then the usual value was $4 an ounce; that retorted out during the last few weeks has been found worth $5 an ounce. The increased value is due to the coarser quality of the gold in the ore now milled.

The Reservoir.—The storms of Saturday and Monday have sent the water rushing into the reservoir very rapidly. The water now stands within 2 ft of high water mark, and should the present inflow continue, the waste gate will have to be opened in a few days; the return of fair weather will, however, reduce this until the supply will more nearly equal the demand, and then it will continue running in until far in the summer. This, with the increased hight of the embankment, gives a much greater supply of water than was ever had here before.

Beautiful Gem.—Plumas *National*, April 29: At the express office the other evening, we were shown something over 80 ounces of dust from the Leavitt claim, at Newtown flat. It is almost all coarse, the largest slug weighing $88, and ranging down from that to fine dust. If is the old lead, and there is no telling how much money the lucky owners will take out this summer. They are working 8 or 10 men at present.

SIERRA.

Savage.—*Mountain Messenger*, April 20: Mr. Ball, superintendent of the Savage mine, was in town this week. He has several men at the mine, but will not commence work until he is able to get supplies in, which will not be for a time yet. The company proposes to push the work as rapidly as possible this summer. During the winter several snow slides occurred at the works, but fortunately did no damage.

The Truckee drift gravel mine, in Mohawk valley, Sierra county, will commence work in a short time. They have 800 ft of tunnel run, and the gravel prospects well. Charley Byrn is superintendent.

TRINITY.

Good Clean-Up. Trinity *Journal*, April 29. Messrs. Baker & Hickey have a quartz mine on Eastman gulch, above Lewiston, which they have been quietly working for some time, and which promises to develop into one of the best paying properties in the county. As an instance of what the prospects are, they have just cleaned up, after crushing 20 tons of rock in their arastra, and realized 21 lbs of clear gold. This is at the average rate of more than $200 per ton, and much more than the lucky owners themselves expected. The vein or lode, we learn, is small, but increasing in size as well as in richness. Trinity will yet show up as a profitable quartz mining county.

Buckeye. After nearly two years silence, "the music of the giant" is heard again in the Bolts Hill claim. There has been a long time of preparation, and last year, owing to the disastrous storms and floods in the winter of 1881, the entire working season was consumed in repairs, and cleaning out ditch from Bolts hill to Van Matre creek, and in fitting up a new claim, known as the "Tolly," on Tolly hill, situated on Stuart's fork, between the Hotart and Cumming's ranches, though on the opposite side therefrom. The Tolly claim is fitted with a good hydraulic rig. This and the Bolts Hill claim are being run vigorously. The Bolts Hill tunnel flume was completed the 13th inst., and water run through the same day, and since has been thoroughly flooded and packed with gravel and rocks, and is now running gravel successfully and rapidly. The bed-rock tunnel, in which the flume is constructed, is 7½ ft by 7 ft, 1,525 ft long, and was begun some 5 years ago, and finally completed December, 1880, but was not flumed until this spring. On the Bolts Hill claim the company erected a sawmill, 18 months ago. All the lumber and one-fourth of the blocks for the flume and incline have been sawed in this mill. This is run by water dropped from the main ditch through the mill, so to speak, and into a reservoir, where it is used as an "under head," when piping is going on. The ditch has been cleaned out this spring from Bolts hill to Van Matre creek, 22 miles, and water is now running through it from the latter. The new portion of the ditch, from Van Matre creek to Stuart's fork, has not yet been repaired, the damage from slides and breaks of the winter of 1881 having been very severe on it. It has not yet been decided when this part of the ditch will be taken in hand. The water season on this property promises to be a good one, a heavy body of snow having been piled up in the mountains above the ditch during the past winter. The ground piping now has a good appearance, and the company is hopeful of results this season.

NEVADA.

WASHOE DISTRICT.

Alta.—*Enterprise*, April 30: During the week ending this date the west drift on the 2150 level was extended 50 ft; total length, 1,190 ft. The crosscut was advanced 42 ft; present length of same, 98 ft. The north lateral drift was advanced 30 ft; total, 206 ft. The diamond drill is in 66 ft in the main east drift, where, so far, no strong flow of water is encountered. Rock hoisted, 676 cars; wood consumed, 113 cords; strokes made by pump, 67 500.

Union Consolidated.—During the week 553 tons of ore have been extracted and 670 tons and 500 pounds have been sent to the mill. Amount of bullion shipped, $37,403 43; bullion in office, $14,390.74.

California.—On the 2700 level the main south lateral drift has been advanced 24 ft. On the 2700 level joint Consolidated east drift No. 2 has been extended 12 ft and is being timbered up.

Mexican.—The main north lateral drift on the 2000 level has been extended 28 ft.

Sierra Nevada.—On the 2700 level north drift No. 3 has been extended 24 ft. In the joint Union Con. east winze are cutting out a station at the 2000 level.

Yellow Jacket.—The water in the mine has risen 5 ft since last report, standing to-day 397 ft above our 2300 station. Have reached the 3100 level of Winter's shaft through old hoisting compartment and find the same in very good condition; are now overhauling the west compartment. Commenced to-day re-opening the old third station 452 ft from the surface, and will run drifts east from same to the old workings on that level. Also intend opening new station between the 4th and 7th stations, about 646 ft from the surface.

Sutro Tunnel.—Four repair men were employed during the first part of the week finishing repairs at this point. Two sets of new timbers were put in and one set removed. Also, lagged up the ground, braced the timbers and spiked down the roof. The force was then removed to the south lateral to assist repairing the heavy ground in that tunnel.

BRISTOL DISTRICT.

Bristol.—Piche *Record*: Of late the Bristol Co. have been working only their low-grade ore through the mill, taken from the top of the ore body, and this has caused the report that the Mayflower ore had greatly decreased in richness. Owing to the inadequate hoisting apparatus at the mine the rich ore at the bottom cannot conveniently be taken out. The ore in the bottom of the incline continues as rich as ever. Wm. Roe is of the opinion that when the well attains the additional 100 ft in depth, now being sunk, that a sufficient supply of water will be obtained to keep the mill running steadily. The work of prospecting is being vigorously carried on in the Day mine. The company keeps a full force of miners employed. The company has done nothing but prospect during the whole of the winter.

BELMONT DISTRICT.

Prospecting.—Belmont *Courier*, April 23: For the past few weeks Geo. W. Emerson has been engaged in prospecting the hill situated immediately east of town. Last Monday he set 3 men to work on one of the claims, and in a very short time the miners succeeded in striking the ledge which carries rich chloride ore. They are now down about 12 ft, and the ore encountered at this depth is of a high grade. The pay streak is about 20 inches wide. Practical miners who have inspected the property pronounce it a very fine prospect, and assert that, judging from surface indications and the developments, rich ore bodies will in all probability be encountered as depth is attained. Below we give the result of several assays made from large samples of ore taken from the ledge: $52.17; $104.33; $101.00; $140.63; $135.47. Mr. Emerson will push the work of development ahead at a lively rate.

EUREKA DISTRICT.

Notes.—*Sentinel*, May 2: Up to the 24th of April the Eureka Con. had shipped bullion amounting to $130,351.90 for that month. Sixty tons of high-grade ore from the Bald Eagle mine has just been shipped to the Eureka Consolidated works. The price of charcoal is just now the great absorbing topic among the Eureka coal kings. The Ruby-Dunderberg Co. is developing some of its old mines. It is also making arrangements to ship ore to the Richmond works. Steam hoisting works arrived several days ago from Detroit, Michigan, for the Alexandria M. Co., but are held at the depot, and will not be put up pending the present litigation. The works are of a capacity to prospect the mine 600 or 700 ft. There is considerable interest felt by the miners on Prospect mountain in the suit between the Alexandria and Pioneer mining companies, as the issue to be determined in this case may be ground for future lawsuits involving the title to several other properties.

ESMERALDA DISTRICT.

Middle Hill Mining Co.—Esmeralda *Herald*, April 29: J. H. Coulter, manager of the Middle Hill Mining Co.'s property, which embraces the well-known Live Yankee and Durand mines, visited Aurora this week and examined the property in question. He has some idea of going to work on the Live Yankee and taking out ore, but cannot say positively that he will until he returns from San Francisco, whither he went last Tuesday. He expects to return here in about 10 days. Mr. Coulter also visited the New Esmeralda and other mines in the district while here.

Humboldt M. & M. Co.—At the mine they are now drifting on the 100 level, getting ready to stope. Some of the ore looks exceedingly good, while some does not show so well, but it is thought it will all pay a fair profit to mill. If there is no bad weather between now and Monday, ore hauling will commence on that day.

GRANTSVILLE DISTRICT.

Developing.—Grantsville *Bonanza*, April 29: George Mitchell, O. B. Snow and John Quantz are hard at work developing their new discovery in this district. Work is progressing steadily in John Center's mine. The ore encountered continues of a good grade.

LEWIS DISTRICT.

Starr-Grove. Lewis *Herald*, April 29: The miners who had been working for the Starr-Grove S. M. Co. were paid off by J. Hill, on Friday last, less a reduction of 5%, on their duo bills. The pumps have been taken out of the Starr-Grove mine and all work suspended till the return of Manager Bothwell, from New York, when the mine will again be started up. The personal property of the Starr-Grove S. M. Co. sold at sheriff's sale, Thursday, brought $1,588.

Betty O'Neal. The stopes in the Betty O'Neal mine are still improving as opened up, and considerable nice ore being taken out. The ore body in the south lower level improves as extended and the quality of the ore is improving. An ore dump is being built alongside the wagon road, from which the ore will be loaded on the wagons with ease and dispatch, and from present appearances the Eagle mill will be kept running on ore from this mine for many months.

Morning Star.—The contractors are still sinking the Morgan incline on the Morning Star mine. The ledge still retains its size and quality. A quantity of the ore is being assorted and sacked. We hear that the company intend erecting a mill at or near the forks of the canyon during the coming summer.

Sunbram.—Work is progressing on the Sunbram mine. A crosscut from the winze is 12 ft in solid quartz and no wall in sight yet. The ore looks well but as no assays have been made lately we cannot state its value.

UNION DISTRICT.

Prospecting.—Grantsville *Bonanza*, April 29: Prospecting promises to be carried on at a lively rate in Union Mining district during the spring and coming summer.

Homestake.—Work goes steadily on in S. G. Post's Homestake mine, in Union district.

WASHINGTON DISTRICT.

Work.—Grantsville *Bonanza*, April 29: A. J. Franklin is pushing the work of development in his mine in Washington district.

ARIZONA.

Lynx Creek Smelter.—Arizona *Miner*, April 28: Much praise is due Major Dake for his persistent efforts to bring out the mineral wealth of Lynx creek. He put up a smelter last summer which, owing to a lack of knowledge how to treat the ores, did not work successfully. Prof. Shaffer, now in charge, has been overhauling the smelter, and will soon start it in a scientific manner, when we expect to hear good results.

The Arizona Queen M. Co., at its mill on Oroom creek, is prepared to do custom work for those who desire to have it done. They have placed the price at such a standard that all can afford to patronize them. Quantities of ore in 10-ton bulk or over, $10 per ton will be charged. Under ten tons, $12.50 per ton will be the price. This is quite a falling off from $60 and $80 per ton, as charged heretofore at other mills.

Desoris Mine.—This new mine has paid from the grass roots down, and is now one of the most promising properties in this county. A few months since 10 tons of ore from this mine were shipped to New York City by Messrs. Cox and Craigue, which netted them $10 320. The same gentlemen who own nearly all the stock are now shipping 18 tons of ore to the same destination, which is actually richer than that shipped heretofore. Besides the high-grade ore, they have over 100 tons of ore which will work $200 per ton. This ore, we understand, is to be worked at the smelter of C. P. Dake, on Lynx creek, by Prof. Shaffer. The ore now out of the Desoris—say 150 tons—will yield $50,000.

Tombstone.—*Epitaph*, April 20: Have struck good ore on the 300 level Tough Nut mine, south from main shaft, which bids fair to open out into a large and valuable body. In the east drift, same level, they continue to get bunches of ore, which shows them to be in ore-bearing ground.

Orard.—Continue to drift east on the 150 level in good ore. Winze from this level to connect with the 200 is down 30 ft, the ore continuing good all the way, with 4 ft in the face. On the 200 tbe north crosscut east is in 35 ft and looking well. At 55 ft north of this point are drifting west to connect with the Tough Nut.

Grand Central.—On the 600 level at the new shaft are in 65 ft. The rock is a very hard, short-breaking limestone, and slow progress is made. On the 600 level, old works, continue to drift north and south on the ledge, which continues strong and well defined.

Contention Con.—The north drift from the west will be pushed to intersect the joint winze on the line between Contention and Sulphuret, when the ore body in the latter mine will be prospected. Are accumulating ore at the rate of 10 tons daily at the mill, to have a surplus when the rainy season sets in. The bullion output will be equal to last month.

COLORADO.

Leadville Notes.—Colorado *Mining Review*: The Imes mine, situated on the crest of Iron hill, will begin shipping a large lot of ore, now on the dumps, in a few days. The Nevada mine, in South Evans gulch, owned by August Rische, is reported to be shipping about 6 tons of ore per day. The Cummings & Finn smelter is receiving 40 to 50 tons of ore per day from the Eagle Bird consolidation, on Battle mountain. The Yankee Doodle mine, of the Carbonate Hill M. Co., is looking well, and continues an output far beyond the expenses of the company. The owners of the Ohio Boy, located on Taylor hill, are reported to have purchased a 20-stamp mill, and and at present are making excavations for the same, near Cooper's ranch. Messrs. Berdell and Witherell have placed the major part of the La Plata stock in England. Mr. Thomas Rickard, of London, is now on his way to take charge of these works. The Long & Derry mines have shown up some very fine ore bodies during the past winter, and large shipments of ore from this hill are anticipated during the summer months.

IDAHO.

Poor Outlook at Banner.—*World* April, 29: The prospects of the summer's operations at Banner are not what all have reason to expect in a district of such a showing as the developed mines exhibit there, but we cannot see that the situation of affairs can be altered in the least by giving off a growl or making a wry face over the management of the properties of that district. From letters received at Banner last week, it is evident that the Elmira Co. do not expect to much more than prosecute the Banner tunnel during the summer, and it is not likely that the mill will start up before fall, if then. In fact, Mr. Brown, the president, writes that unless they make a run in the fall he will not visit Banner this year. J. L. Brown, superintendent, will be seen out to attend to all of the company's business. Thus, it must be seen, that Banner, one of the richest deposits on the coast, will be exceedingly dull this season, and all for the want of capital to erect hoisting works, set up mills, and carry ahead the mining business in an energetic manner. The Elmira is a small company with non-assessable stock and its members feel the necessity of moving at a moderate pace—too moderate for their own good, we think.

The Banner Tunnel.—The tunnel now driving to tap the Banner mine will be the longest one yet driven in Boise county. It will be 800 ft in length and will tap the vein 300 ft from the surface and about 200 ft below the old stopes. The Welch boys, who have the contract, have been pushing ahead remarkably fast, considering the size of the force engaged—2 shifts of 2 men each. Work was commenced about 2 months ago and the tunnel is now in 200 ft, but the prospects are that hard ground will be encountered before long which will lessen the rate of its progress considerably. It is expected that the vein will be reached about the 1st of October. The tunnel, besides furnishing an outlet for the ores above, will serve to drain the mine. The highest grade ore found in that district was taken from the Banner, and the prospective work in the shaft and levels above indicates that this tunnel will intersect an ore body greatly superior to that of the Crown Point. We learn that the large pump of the Gold Hill mine, at Quartzburg, which has caused the company a great deal of trouble since it was put in, is now working as smoothly as could be wished and doing good execution.

MONTANA.

The Alice Property. *Inter-Mountain*, April 21: The Alice Co.'s mines and mills are in successful operation, and the outlook for the future, there is every reason to believe, is exceptionally bright. During the past week no startling developments are reported in the Alice, but in all parts of the mine which are being worked satisfactory progress is being made. Between the 600 and 500 levels the stopes are being opened up by a force of 16 men, who daily extract a considerable amount of fair grade rock. From the 300 level, at a point 100 ft east of the crosscut, the big winze is being sunk on the hanging wall of the north vein with favorable results. The uniform width of this portion of the ledge is very encouraging and its value is a source of equal congratulation. No samples lower than $60 have been obtained since work on the winze was begun. The sinking of the main shaft will not likely be resumed at present, though the President of the company is seriously considering the feasibility of purchasing a Cornish pump, and then proceed with the work of deeper development.

The Main shaft of the Magna Charta has attained a depth of 500 ft. The station is now being cut out, but the crosscuts will not be started until a sump 25 ft deep shall be finished. The second, third and fourth levels are now producing 50 tons of ore per diem, which is shipped to the mills over the very substantial and creditable tramway recently erected.

NEW MEXICO.

Mineral Pick-Ups.—*News and Press*, April 22: Five silver mines are said to have been discovered in the Capitan mountains, 9 miles from Lincoln. The Grand View and Tenderfoot are spoken of as the most promising mines in the Gallinas mountain camp. The Jicarillas are full of prospectors looking for gold leads, which are believed to be numerous and rich in some parts of that range. Preparations are being made for litigation over the Pecos copper mines. It is thought the fight will be a strong one, as the mines are considered of great value. The mining boom at Bonanza is reported to have commenced. The Gonzales concentrator has started up, mining operations are greatly stimulated and ore is accumulating. The Homestake mine, at White Oaks, is reported to be yielding high grade gold ore in fair quantities. The new mill at that camp has some 400 tons of ore on hand ready for working.

OREGON.

Busy.—Jacksonville *Times*, April 28: W. H. Benner, of Willow Springs, called on us one day this week and informs us that the miners in that section were still busy piping and ground-sluicing, the late storms having furnished them plenty of water. John Beckner informs us that the miners of Forest creek have had a good run this season, and all of them will commence cleaning up soon. Vickroy & Reed have already started in gathering their gold, with favorable results.

Items.—The English Co. has about worked out its claims on Oalice creek, excepting one or two.....Peter Hansen, of Althouse, has washed off a large area of ground already, with favorable prospects.... The recent rains keep up the supply of water well. Especially is this the case in Josephine county.....Riley Hinkle, who is employed on Humbug creek by J. Johnson, reports good prospects in that claim.....The miners of Josephine county will make an excellent run generally, the spring being quite favorable.....The Wm. Clark, of No. 7, a tributary of Althouse, has struck an exceedingly rich pay streak, taking out $700 in a very short time. He is said to be averaging $40 a day.....Seven "little giants" are busily employed in claims whose tailings are dumped into the Applegate above Uniontown. As a consequence, that stream is quite muddy.....J. W. Howard has purchased L. McElvey's interest in the hydraulic claim being opened on Oalice creek by McElvey & Simmons. Excellent results are promised here.....N. DeLamater & Co.'e mines on Coyote flat are turning out very well. Several clean-ups have been made during the season, one of which reached the neighborhood of $2,000, we learn.....Some copper mines near Waldo have been bonded to Portland capitalists, who are also interested in the location of others. The prospects are favorable for a boom in that section in the near future.

UTAH.

Little Cottonwood.—Cor. Salt Lake *Tribune*: On a recent visit to Alta, a few facts were gathered that will perhaps interest your numerous readers. The tramway was opened for traffic on the 23d inst., and is in good order with the exception of the last 2 miles, the last named portions being more or less obstructed by ice. The outlook for the summer campaign is quite flattering, as compared with the last 4 years, and many a prospect that has laid idle for years will be probed anew. Already teams are busily engaged hauling the ore taken from the mines during the long winter, to the tramway for transportation to the smelters at Sandy, where it can be readily sold for high rates, it being a class of ore sought after by furnace men. About 200 men are engaged in prospecting and mining. At Cits ore and a number of men are employed and rumor says they are making splendid developments on the great mineral belt passing from L'ttle to Big Cottonwood district and the ce to Parley's park. As to the present workings we are not at liberty to speak, but it is sufficient to say that it will prove one of the greatest mines of Utah. The old and once famous Emma is now being worked on a lease; a part of the old upper works are paying a force of men a good per diem. The troubles between the old English and the new American company are not yet adjusted, although so reported last fall. Negotiations are now in progress in London that will doubtless soon release this valuable property from the entanglements of the law, when it will take the front rank among the producing mines of Utah. The Joab Lawrence (Old Vallejo) is being worked by about 25 men, and is said to be looking exceedingly well. Our old and genial friend Stevenson is in command, and being a full grown, we were afraid to put important questions. They have a large quantity of high-grade ore ready for shipment. The Flagstaff Co. employ at present about 25 men and are taking out some fine ore from a 3 ft vein. It is understood this company will push things this summer and make a showing worthy of their great reputation. The Frederick Co. are driving their tunnel as rapidly as possible. Watson & Douglass have a contract, and are working night and day to finish on or before May 20. The prospects of this company are among the brightest in the camp. The immense depth attained by their tunnel the case, and all of them will commence cleaning up soon. Vickroy & Reed have already started in gathering their gold, with favorable results.

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Annual Ring Growths and Rainfall.

The National Forestry Congress was in session last week in Cincinnati. The object was to promote the planting of foreet trees. The programme included a street parade and the planting of memorial trees for Presidents, authors, pioneers and others, in the public parke. Provision was mede for 93 papers to he read by different persons, selected from all over the United States and Canada. One of these papers is by Rohert E. C. Stearns, Ph. D. of Berkeley, Cal., and is of much local iuterest. The suhject ie "The Growth of Certain California Forest Trees and the Meteorological Inferences Suggeeted Thereby."

While in Napa county, during the month of October, 1881, I noticed in a clearing lately mede on the top of Howell mountain, that, in felling, most of the large trees had been sawed across at the butt, instead of heing chopped down with an ax, thus making an even cross-section or plane eurfece, and admitting of the counting of the rings of growth.

It was my intention at the time to have taken these notes myself, and, further, to have made a diagram ehowing the exact width or thickness of each of the annual rings, in order to make a comparison of one tree with another and to learn whether the annual rings or growths of each year, commencing with the last year and comparing backward, year with year and tree with tree, exhihited a coincidence in thickness or a coincidence in variation. Before proceeding further in the elaboration of this point, I will state that lack of time prevented my making the diagrams, and that the following measurements of four trees of the species known as *Pinus ponderosa*—or yellow pine—were made for me by Mr. A. L. Roache, who was then visiting the region:

	Inside of bark, Inches.	Outside of bark, Inches.	Annual Rings.	Average Annual Growth inside of bark—Inches.
No. 1	20½	24½	54	.3796
No. 2	27½	30½	75	.3666
No. 3	33½	38	80	.4187
No. 4	24	29½	72	.3333

Mean annual growth, .3745 of an inch.

The thickness of the bark, it will be seen, varies considerably. The differences in the diameters, as shown in the colnmns, "inside" and "outside of hark" heing that of the bark on the two sides of the tree, require, therefore, to be divided by two, to give the true thickness, and gives No. 1, two inches; No. 2, one and a half inches; No. 3, two and a quarter inches; and No. 4, two and three-quarter inches.

These trees stood in such a station or position, as to uniformity of conditions, *i. e.*, character of soil and surface, exposure, etc., as to furnish a fair hasis for a calculation of the kind herein made.

It will be observed, upon adding up tbe column of annual rings, and also the colnmn of largest diameters, and then dividing these totals by four to get the average, that in the region where they grow, about 70 years were required to make a yellow pine 30 inches, or two and a half ft. in diameter. The mean thickness of the annual rings in the above trees, .3745 of an inch is nearly three-eights of an inch, or .375.

If we had similar and snfficient data from various places, we might make a pretty accnrate approximation and generalizetion of the kind above illustrated; in this, the data being limited, the region to which they apply must also he limited, and to the species—the single species only—as above given.

The pines are quick growing trees, and, in common with other related forest forms, make a proportionately larger growth in their early years, or, in other words, make thicker annual rings when young than wheu old, tbongh in an equally vigorous condition; so that a measurement of young trees, thongh nseful as showing how loug we may have to wait to get a profitahle return in fuel or lumber from an artificial plentation, euch young trees would not answer the purpose of a standard of age or measurement for the large trees of natural forests.

In the neighborhood of Berkeley, trees of the Monterey pine, 9 or 10 years of age, show a maximum diameter of one ft. three inches, being a growth of over an inch a year, and a mean diameter, so far as I have measured, of nine inches, the result of eeveral trees. These were planted for ornamental purposee.

Sections of the following epecies of foreet treee, indigenous to the Pacific coast, are contained in the museum of the University of California, and yield the data given below:

Abies grandis, or white fir—Large diameter, 23 5-16 inches; smaller diameter, 22 11-16 inches; mean diameter, 23 inches; thickness of bark, three-fourthe of an inch; annnal rings, 146; mean annnal growth, .1575 of an inch, or a little nnder one-sixth of an inch per annum.

Abies Douglassii, or Tsuga Douglassii, the hemlock epruce, so called—Larger diameter, 17⅞ inches; emaller diameter, 16⅝ inches; mean diameter, 17¼ inches; thickneee of hark, half an inch; annual ringe, 96; mean anuual growth, a trifle nnder .18, or something over one-sixth of a inch.

Abies Mertensiana—Larger diameter, 18¾ inches; emaller diameter, 16⅜ inches; mean diameter, 17½ inches; thickneee of hark, a trifle over half an inch; annual ringe, 110; mean annual growth, nearly .160, heing eomething lese than one-sixth of an inch per annum.

These three speciee of *Abies* are represented in the ahove measurement hy trees which grew in or near Gualala, Mendocino county, an exceptionally favorahle station eo far as moisture is concerned, the country heing well watered, and the couuty, in common with the entire region from the Oregon line to and inclueive of Marin connty as the southern terminue, heing part of a meteorological province, which receives not only a greater average rainfall than other parts of the State, hut also the fullest advantage of the summer fogs, which, horne shoreward hy the trade-winds, are condensed by the lofty evergreens which here abound, and fall to the grounnd, dripping throngh the foliage of the trees, like a gentle ehower. A comparison of so moiet a region with the drier areas, ehows at a glance the neceeeity of a careful consideration of environmental conditions in connection with deductions from data, of the kind herein referred to.

A section of *Sequoia sempervirens*, our common redwood, shows, counting from the circumference toward the center, a growtb of three inches in 95 years, or, more particularly, 95 growth rings, averaging .0316 of an inch per annnm. Notwithstanding the majestic proportione which the *Sequoias* ettain, the above measnrement, as well as an examination of the ende of a large number of redwood boards, sbow that these trees are of slow growth.

The measuremente of a epecimeu of *Sequoia gigantea*, ae given with great particularity hy Prof. Whitney in the Yosemite Gnide Book (edition of 1870), pages 147-8, give a mean diameter of 23 ft. 3¾ inches, without hark, and 1,255 annual rings, a mean annual growth of only .2229 of an inch, very nearly, heing less than one-quarter of au inch a year.

It is not nnlikely that the comment may be made, that the data here presented are so meager as to be of little value, though perhaps interesting and suggestive. This I am quite ready to admit, and while doing so will revert to the point temporarily dropped near the beginning of tbis paper, and speculate a few moments in the direction which said point indicated.

Meteorological Inferences.

Any one who hae taken the trouble to examine the annual growthe, or width of the annual rings in trees, has at once perceived a great difference in their thickness in the same tree. If we may assume (leaving out young trees) that this variation is principally due to the amount or qnantity of the rainfall, and that rings which exhibit maximum thicknese have followed in their growth seasons of maximum rainfall, and the thinner rings are consequently the resnlt of the influence of seasons of a less or minimnm rainfall, we may assume that if, upon a given date, numerous trees were felled, so that we could have transverse sections of all of the principel species, such trees being located at various points in the State, great care heing taken that the trees so eelected should have heen snhject, as nearly as possible, to the same environmental conditions, we might obtain an aggregation of data of sufficient volume to render a deduction therefrom of great value, as to the meteorology of the Pacific coast. We might find so close a parallelism between rings of maximum thickness aud seasons of meximum rainfall, that we should he justified in regarding this parallelism as something more than a series of coincidences merely, by finding these coiucidencee so persistent as to prove a correlation; and we could, perhaps, base our weather prognostications upon something more than a gness, and learn whether or not there is a periodicity or cyclical terms of wet and dry years. Having the data before us according to the trees selected and examined—reaching back with the piues from 75 to 150 years, with the redwoods from 5 to 700 or more years, and with the *Sequoias* of the Sisrra from 12 to 14 ceuturies, to say nothing of the testimony of other trees, the madronas and oaks especially.

The forest monarchs of the Sierra Nevada and the Coast ranges offer a calendar, whose records have been written by the elemeuts; and so far as the giant *Sequoias* are considered, their evidence would certainly be that of the oldest inhabitants, substantially snpported by their first of kin, the magnificent redwoods of the Coast ranges.

Another matter of minor, though not of insignificant importance, would be the relation hetween greatest diameter and the points of the compass, as to whether the greateet diameter is persistently incidental to a certain aspect or quarter of the compaes. In the epecimeu of *Sequoia gigantea* above meutioned, Professor Whitney givee the greatest diameter, north and south, as 24 ft. and 1½ inchee, while the "shorter diameter, or that east and west, was 23 ft. divided exactly even on each side of the center." "Acrnse its longest diameter, eouth of center, 13 ft. 9½ inchee." "Across ite longeet diameter, north of center, 10 ft. 4 inches," or 24 ft. 1½ inchee, as before etated, a difference between the north and eouth eide of the center of 3 ft. and 5½ aud inchee in favor of the latter.

Difference in the diametere may be traced perhape to a difference in amonnt of heat and light, which oue eide of a tree receivee as compared with the other; to the influence of prevailing winde according to the etation, position or exposnre, or to local or general magnetic influencee—local as peculiar to emall areas, or general, ae pertaining to larger or exteneive regione. An accumnlation of data might ehow a marked and constent character in the relation of diametere to such factore of the environmeut; and also a marked character in the diameter of one region, as a whole, when compared with another region, wbere modified or different climatic conditions exist.

In a comparatively arid region, with a high mean temperature and infrequent rainfall, and a dry atmoephere, we mey suppose that the southerly half of a tree, following the curve of its circumference from east by way of south, to west, might, throngh excese of light and heat, suffer from desiccating influences, and make a less growth than tbe northerly balf, following the curve of the trunk from east by way of north, to west, as the northerly half would have tbe advantage, if advantage it be, in such a climate, of less light and heat and more shade; while in a region less arid with a much lower mean temperature, etc., the greater proportion of light and heat which the southerly half receives, would give that side of the tree an advantage over the northerly half.

Ae to the effect of prevailing winds in differentiating the diameter, we may suppose that the side of a tree most exposed might be affected, and the growth on the windward side much modified or repressed; wbile the leeward or sheltered, heing protected, would exhibit a greater diameter or semi-diameter, measuring from the true center of the tree, *i. e.*, from its initial ring.

In the "hig tree" measured by Prof. Whitney, the southerly half of the diameter shows the excess, indicating that heat and light were specially advantageons; but here altitude comes in ae a factor, as the hight of the Calaveras grove, or rather ite site, ie 4,759 ft. above the level of the sea, au elevation where, though the heat of the eix mid-day honrs in June and July ie 80° and upwards, the nighte are cool; and as Prof. Whitnev remarks, "during ordinary years, * * * the flanks of the Sierra are well covered (with snow) down to 4,000 ft. above the sea dnring mid-winter months, and a heavy body of snow liee on the passes until May, or even Jnne." So, after the snow has melted up to and above the altitude or eite of the grove, the atmosphere is cooled for a long period afterwards by the snow-clad slopes and the unmelted massee of enow upon the higher flanks of the Sierra beyond.

In the consideration of all the factore which suggest themselves, and which no doubt are more or less operative or interoperative, the least perceptible, thongh perhaps the most important, is that of compensation, which modifies or neutralizes what at firet appear to he conspicnone and dominating influences.

What is above presented, it should be understood, is simply hypothetical, and for the pnrpose of awakening discussion and calling attention to a moet interesting subject; one which, if generally understood, would he of great practical importance. At present the data are so exceedingly meeger as to preclnde anything more than spsculation, or to incite to or stimulate investigation.

From a knowledge of tbe various points of inquiry herein snggested, might he deduced a generalization, indicating a universal and preponderating law.

An Eastern View of the Situation.

The Eastern mining industry is on a eounder basis to-day tban at any former period in its history. It is more respectable in character, having enlisted the capital, eympathy and snpport of a large number of most excellent people. It is more intelligently conducted, having profited by the experience of the past, and attracted to its camps numerous able miners from abroad. It commands greater respect and confidence, for it now has sometbing to show for the time consumed, labor employed and money expended. Ite lodes have beeu exploited to hundreds of ft. in depth, determining beyond question their permanency; and the valne of its ore has been demonstrated by mill and furnace rune and nullion receipts. It has reached that point when critical investigation may be courted, confident that the results of such investigation will be eatisfactory. It has broken down the wall of prejudice, and disarmed its enemies. It has achieved success, and is on the high road to popularity. Henceforth progress will he easier and epeed more rapid. Few people realize the extent of the work accomplished during the past tbree years, and a still lees number comprehend the Eastern mining situation as it stands to-day. Two extensive redoction worke, onè in Portland and one in Eaet Boeton, are rnnning steadily on oree from the minee of Maine and New Hampshire, and thousands of tone are heing shipped to smeltere in New Jersey and elsewhere. There are now lying on the dumpe of the mines of thoee two Statee awaiting shipment or the completion of local reductiou works, fully 100,000 tons of ore, poesessing a value above the cost of prodnction, transportation and working. And a far greater amount of etill richer ore may be eeen and measured in the shafte and levele of these mines, ready, on the completion of proper reductiou worke, to be converted into bullion, pige, bars, bricke and ingots, having a commercial value in every financial center in the world. And theee resnlts have been attained in far lese time than our fathere required to clear their lands of rocks and timher; in lese time thau it takee a boy to gain hie degreee or learn a trade; in lees time than a corner-grocery etore can be put on a paying baeie.—*Boston Advertiser.*

Streams and Water in Shasta County.

The streams of the county are numerous, and all fall into the Sacramento—a name first applied to California's principal river about 20 miles north of Redding, at the confluence of Pit and Little Secramento rivers. The Pit is several times the larger stream. In what is known as "Big Bend" of this river is sufficient land of good quality for quite a colony. Pit river has ite source in Lassen connty, flows westward into Modoc, southwest back into Lessen, and thence into Shasta, near the northeast corner. Through Lassen and Modoc the Pit is a eluggish stream of watsr of poor quality, hut soon efter entering Shaeta county it receives Fall river as a tributary. This is one of the fineet streams in the world; beautiful, clear, cold, pleasant tasting water, cold enougb to drink in summer, and warm enough not to freeze in winter, the variatiou in etage being lese than two ft. Being a typical stream in that portion of the county the description of it may he referred to in connection with several others. The whole course is but 14 or 16 miles. The water rises through a great number of eprings in a emall area, and forms a lake about one-half by two miles. From the leke the river winds through a beautiful valley, having several small rapide in its course, until within about 200 yards of its mouth, where it passes over a ledge in a eeriee of cataracts and rapids, making a total descent of 60 ft. The river is 20 yards wide, 4 or 5 ft. deep, and flows with a good cnrreut. This and other streams near by are most probably fed from the great lava regione to the east and north. The next two tributaries, Hat creek and Burney creek, flow into the Pit from the south, and are in many respects similar to Fall river. Next, also on the south, are Roaring river, Hatchet creek and Montgomery creek; on the north, Squaw creek, McLeod river and the Little Sacramento. These tbree have many features in common: They take their rise in the high mountains around Shasta Butte, flow south, clear, very cold and very rapid, each about 100 milee in length, and fall into the Pit within a distance of 15 miles. The McLeod is the largest, and is almoet ae large as Fall river. The United Stetes fishery is located upon it, near the mouth, 21 miles from Redding.

From the entrance of Pit river into Shasta county to its confluence with the Little Sacramento aud change of name it flows in a general westwardly course, though making several bends, choked and turbulent through wild and glorious canyons; but with change of name it changes ite course south, and enters the bottom lands of Redding.

Below this poiut comes Clear creek from the west, Churn creek, Stillwater, Cow creek aud Bettle creek from the east, the last forming the boundary between Shasta and Tehama counties, on the east side of the river, as Cottonwood creek does on the west, the only remaining stream on that eide. Cow creek is a large creek, having many branches, all rising in the high Sierra Nevadas. Battle creek receivee tbe waters from west side of Lassen Butte, as does Hat creek on the east side. These two creeks have sourcee close together; each is about 30 to 40 miles long. The former empties into the Secramento, the latter falls into Pit river 80 miles above, at an elevation of more than 2,500 ft.

Besides the streams named, there are bundrede of others of smaller size. Water privileges exist to an extent practically unlimited, and edible fish abound in all the watere, trout aud salmon being the principal varieties. Springs are found at frequent intervals. The water varies greatly in character, bnt is generally healthy and pleasant tasting. In sinking wells the depth necessary to obtain a enpply of water varies from 15 to 50 ft., according to locality. No test has been made to obtain artesian water, but the geologic formation is of the most favorahle charecter.

From Redding, by the river, it is more than 100 milee to the entrance of the Pit from Lasseu county northeast, and 25 miles to the Tehama line south. The total length of the Sacramento, Pit, Little Sacramento, McLeod and Fall rivers in the county proximates 250 miles.

THE DAY CO.—The Pioche *Record* says: We have received a numhsr of communications from subscribers who reside in California aud from the western portion of Nevada, inquiring as to affairs pertaining to the Day company. Perconally, we know nothing about the affairs of the company, neither does any person in thie vicinity outside of the euperintendent, and as that gentleman appeare dieinclined to epeak upon the euhject, we have not questioned him in regard to the matter, ae we know euperintendente of miuee are not at timee permitted to speak of the company'e doings whoee property they are in charge of, and it would not he a pertinent queetion for us to pnt to the euperintendent of the Day under existing circumetancee. The furnace is not running, neither have they etarted in repairing it ae yet. The furnace may poesibly etart np between eixty and niuety days; then again the company may never start up their old furnace. It looke to ue ae thongh the company was as yet nndecided whether to etart up the old furnace or immediately erect new ones. At the mine, proepecting ie vigoronely going on, and the euperintendent, McNally, appeare highly elated. The only definite information we are ahle to give inquiring euhscribers, ie tbat the Day mine contains a large body of high-grade ore. No person is allowed in the miue.

The Engineer.

Expansion of Hard Caoutchouc.—Ordinary vulcanized caoutchouc should contain about one-tenth to one-sixth of sulphur, a greator proportion yielding a hard, horn-like product, which expands considerably when heated. It was established by Mr. Kohlrausch, some years ago, that this hard caoutchouc, while expanding equally with mercury up to the freezing point, expands much more at higher temperatures, so that in a thermometer consisting of a vessel of this material filled with mercury, the latter would appear to contract with an increase of temperature. Results of experiments made by Mr. R. Fuess, of Berlin, appear to confirm Prof. Kohlrausch's statement. Mr. Fuess placed a rod of caoutchouc one-fifth of an inch thick in a glass tube three-fifths of an inch in diameter, and filled the tube with mercury to a hight of three ft., exactly up to a little pin of platinum projecting horizontally from the caoutchouc. The calculations from 15 observations, in which he was assisted by Dr. M. Tiessen, gave an expansion coefficient of .000082 for each degree C. up to a temperature of 65° F.; higher figures resulting from observations at higher temperatures.

Reclaiming the Zuyder Zee.—According to recent reports it seems to have been definitely determined to reclaim the Zuyder Zee, Holland, whereby a large tract of land would be rendered available for agricultural and other purposes. The engineers in charge of this work have been engaged for 10 years past in preparing the plans, and the total cost is now estimated at not less than $46,000,000. The dyke will be about 24½ miles in length, and will extend from the city of Enkhuisen to the coast of the province of Overyssel. The top of the dyke will be built to the hight of 16 ft. above the level of the sea, which will bring it about 6½ ft. above the highest tide. The dyke will be formed from sand and faced with clay, and will be built of sufficient dimensions to resist the heaviest seas. It is intended to commence operations on the work at four different points, and the calculation is to have it completed in from seven to 10 years.

Compressed Air Motors.—The Mekarski compressed air motor is about to be tried on one of the Philadelphia street railways, and the claim is made that it is destined to supersede animal power on street railways everywhere, with a great increase of comfort to passengers and of dividends to stockholders. This motor has been used in Nantes, France, for over three years, running through the busiest parts of the town. In Paris it operated two lines, and contracts for its use are said to have been made in England with 17 horse-car companies. The plan is claimed to be also especially adapted to elevated railways, being cheaper than steam power. The invention simply consists in passing dry air through water heated to a temperature 330° Fahr. The air, after passing through the water, is expanded 100%, thus producing a motive power with an economy of 75% over that of steam.

Iron vs. Wood for War Vessels.—Some of the officers at the Brooklyn Navy Yard who are superintending the repairs of the wooden war-steamer *Tennessee*, which was run into by an iron merchantman, find an argument in favor of the adoption of iron in shipbuilding. One of them said: "Here was an iron vessel, moving only three knots an hour, and when she bits the *Tennessee* she very nearly sinks her. Think what would have been the effect if this merchant vessel had run against the man-of-war with malice prepense. And the *Tennessee*, though not so strongly built as some wooden vessels in the service, is so very little inferior to the best that the difference is not worth mentioning." Even in the navy, prejudices against iron vessels are fast disappearing.

Great Enterprises.—This is an age of great enterprises. A railroad is projected, at present on paper, from Jersey City to San Francisco. Capital, $150,000,000. Another company proposes to build a double-track from Jersey City to Washington. Another project contemplates furnishing a dozen Eastern cities with gas light from the mines. An irrepressible enthusiast proposes to bridge the Delaware at Philadelphia with a $4,000,000 bridge. It must be admitted, however, that the accumulation of wealth is so rapid that such enterprises may become practicable much sooner than old-time methods of calculation would admit of. Enterprises pushed to successful completion within five years would have been laughed down as chimerical 20 years ago.

Railway Wear and Tear.—A curious fact was lately mentioned by Mr. F. W. Webb, President of the Manchester Association of Employers, etc. The Northwestern railway company, he stated, used steel rails, and yet the wear under the ordinary traffic of the road was so great that one-third of a pound of steel was lost on every mile run, or, 1,500 lbs. every hour of the day. The collective wear of the locomotive engines, of which there are 1,679, was such that a new engine was required to be put into the traffic once in five days.

The Number of Vessels at the present time plying between the United States and Europe is 5,210, of which 4,655 are sailing vessels, and 565 steamships.

Useful Information.

The Willow as a Timber Tree.

And there are some trees which are deserving of more attention than has yet been given them in this country. The willows, for instance, have seldom been cultivated in a large way; and yet there are few trees so easily grown, or which will pay better for cultivation. They adapt themselves to a wide range of soil and climate. They grow on high ground and on gravelly soils not less than by the sides of streams, where we most commonly see them. They are of rapid growth and yield a large return. The osier-willow is especially useful, we know, for the manufacture of baskets, chairs and other articles of furniture, and we import it to the extent of $5,000,000 annually, when we might produce it easily in almost any part of our country. We hardly think of the willow as a timber tree or for the production of lumber, but only as yielding a cheap, poor sort of fuel. But in England the wood is greatly prized for many purposes. While it is light it is also tough; it does not break into slivers. Hardly any wood is so good, therefore, for the lining of carts and wagons used in drawing stone or other rough and heavy articles. It makes excellent charcoal, especially for the manufacture of gunpowder. It bears exposure to the weather, and boards made of it are very serviceable for fences. Some species of it are admirable for use as a live fence or hedge. On account of its comparative incombustibility, the willow is eminently useful for the floors of buildings designed to be fire-proof. It grows to a large size and furnishes a great amount of lumber. There is a white willow growing in Stockbridge, Mass., which, at four ft. from the ground, measures 22 ft. in circumference and extends its branches 50 ft. in every direction. Tradition says it was brought from Connecticut in 1807 by a traveler, who used it as a riding switch. The Hon. Jesse W. Fell, in giving an account of experiments in tree-planting on an extensive scale in Illinois, says: "Were I called upon to designate one tree which, more than all others, I would recommend for general planting, I would say unhesitatingly it should be the white willow." Prof. Brewer says: "In England, where it is often 60 or 70 ft. high in 20 years, there is no wood in greater demand than good willow. It is light, very tough, soft, takes a good finish, will bear more pounding and knocks than any other wood grown there, and hence is used for cricket bats, for floats to paddle-wheels of steamers, and brake-blocks on cars. It is used extensively for turning, planking coasting vessels, furniture, ox yokes, wooden legs, shoe lasts, etc." Fuller says: "It groweth incredibly fast—it being a by-word that the profit by willows will buy the owner a horse before that by other trees will pay for a saddle." The basket willow, well cultivated, will yield a net income of $150 a year to the acre. On the whole, therefore, it would seem that the various kinds of willow, the economic value of which has been hitherto entirely overlooked in our country, are eminently deserving of attention, and will amply reward those who cultivate them.—*Methods and Profit of Tree Planting, in Popular Science Monthly.*

The Danger of Chlorate of Potash.—The dangerous nature of the manufacture of colored fires is recognized in this country by their being included in the laws relating to pyrotechny. The following report, which we take from the Australian supplement to the *Chemist and Druggist*, may serve as a caution to experimenters and manufacturers: A shocking occurrence took place at Wellington (N. Z.) on Dec. 21st, by which a lady was literally blown to pieces and a building partially wrecked. The facts are as follows: At the shop of Mr. Barrand, chemist, Lambton Quay, some blue fire was in course of preparation for use at the theater. On testing a small portion of the mixture, it was found dangerously explosive, too much chlorate of potash having been inadvertently used in the composition. Accordingly, Barraud's assistant, named Anthony, formerly of Christchurch, took it out into the back yard and began to destroy it by slow combustion. He had occasion to leave for an instant, and before he could return his wife happened to go into the yard, and seeing chemicals on fire at once threw a bucket of water on the burning mass. A terrific explosion immediately took place, which shook the whole city and was heard at a distance of some miles. Poor Mrs. Anthony received the full force of the shock, and was frightfully mutilated.—*Chemist and Druggist.*

Chrome Leather.—Experiments show that the new chrome leather—the result of the new tanning process by bichromate of potash—exceeds in tensile strength the bark-tanned article; also that after it has set under the necessary stress, it still retains an extraordinary amount of elasticity, which is available for tightening belting on pulleys. As illustrating this statement, the fact is shown that a piece of chrome leather bore an ultimate stress of 3,297 lbs. per square inch, while a piece of bark leather only bore an ultimate stress of 2,672 lbs. per square inch—this example proving the samples of chrome-tanned leather to be stronger than the bark-tanned by some 15%.

How to Tighten Wagon Tires.—Apply some leather rings between the shoulders on the outer ends of the spokes and the corresponding portions of the felloes, which may be done as follows: Procure a number of small pieces of leather, from an inch and a half to two inches in diameter; with a sharp knife and a compass, or a cutting punch, make round holes in the center of these pieces, and make a straight cut from the hole to the outer edge of the pieces, so as to form open rings. The holes must be made of a size that will nicely fit the tenons on the out ends of the spokes. Place a fulcrum on the top of the hub, on which place your lever, with the short end under the felloe, near a spoke; have an assistant bear down on the other end sufficiently to raise the felloe, and expose the shoulder and tenon of the spoke, open your leather and fit it nicely around the tenon, holding it to its place while your assistant relaxes the lever and settles the felloe firmly upon the spoke by a blow or two upon the tire. Having repeated the process with a sufficient number of spokes to make the tire all right, trim off the projecting leather even with the surface of the spokes and your task will be done. If your pieces of leather should be spongy, hammer them down before using.

Cements.—The following observations upon cements may be found useful. It has been ascertained that cement that has been prepared by grinding with mill-stones has only half the firmness that it shows when ground in centrifugal machines. The difference is explained by the fact that the centrifugal mode of grinding yields a much more finely divided product, which increases the hardening quality of cement mixed with sand. Coarse sand gives the highest degree of solidity and firmness to cement. It is unnecessary, when coarse sand of one sized grain has been used with cement, to mix finer sand with it to fill up the interstices of the mixture, as other indifferent substances can be used with equally good results. Moist carbonic acid has been found to diminish the firmness of cement to a considerable degree, and in a short space of time. The great difficulty encountered in manufacturing marble imitations from cement, is to prevent the cracking of the latter. Cement cracks when it is made up with too much water. It then forms a vitreous crust, and is not homogeneous throughout its mass. By adding finely-crushed granite fragments to cement without sand, a material is obtained that has great hardness, and which is susceptible of taking a high polish.

Good Health.

How to be Happy and Long-Lived.

First, study to acquire a composure of mind and body. Avoid agitation of one or the other, especially before and after meals, or while the process of digestion is going on. To this end, govern your temper; endeavor to look on the bright side of things; keep down, as much as possible, the unruly passions; discard envy, hatred and malice, and lay your head upon the pillow of charity with all mankind. Let not your wants outrun your means. Whatever difficulties you have to encounter, be not perplexed, but only think what is right to do in the sight of Him who seeth all things, and bear without pining the results. When your mea's are solitary, let your thoughts be cheerful; when you are social, which is better, avoid disputes, or serious arguments, or unpleasant topics. "Unquiet meals," says Shakespeare, "make ill digestions;" and the contrary is produced by easy conversation, a pleasant project, welcome news, or a lively companion. I advise wives not to entertain their husbands with domestic grievances about children or servants, nor ask for money, or propound unreasonable or provoking questions; and advise husbands to keep the cares and vexations of the world to themselves, but to be communicative of whatever is comforting, cheerful and amusing. Self-government is the best step to health and happiness.

In this connection the following suggestions are apropos:

Eat slowly, as if it was a pleasure you desired to prolong, rather than a duty to be performed as soon as possible.

Don't bring your prejudices, your dislikes, your annoyances, your past misfortunes, or future forebodings to the table. They will spoil the best dinner.

Respect the hours of meals; you have no right to injure the temper of the cook, destroy the flavor of the viands, and the comfort of the family, by your want of punctuality.

Have as much variety in your food as possible, but not many dishes served at one time.

Find as little fault as possible with the food prepared, and praise when you can.

Finally, be thankful, if you have no meat, that you have, at least, an appetite, and hope for something better in the future.

Importance of Sanitary Regulations.—The deaths in the Peabody buildings, London, during 16 years, have been at the rate of 16 and 7-10 per 1,000 per annum, while the general death rate of the metropolis during the same period has been 23 and 4-10ths. The death rate in the crowded districts surrounding the Peabody buildings has been stated to be 30 or 40 to 1,000. Dr. S. Gibbon, medical officer for the Holborn district, London, says in his latest report that, whatever may be the cause, there is no doubt that a Jew's life in London is, on an average, worth twice as many years as a Christian's. The Hebrews of the metropolis are notoriously exempt from tubercular and scrofulous taint. Pulmonary consumption is very rare among them. The medical officer of one of the Jewish schools has remarked that their children do not die in anything like the same ratio as Christian children. In high street, Whitechapel, the average death rate on the north side, which is occupied by Jews, is 20 per 1,000, while on the south side, which is occupied by English and Irish Gentiles, it is 43 per 1,000.

Foods for Infants and Invalids.

It may be questioned whether there is any subject which comes more closely home to people of all classes than the character of the food supplies specially provided for infants and invalids. The increasing demand for this class of preparations (due partly to an actual need, but chiefly, we suspect, to the skillful advertising of manufacturers and the liberal margin of profit they offer to the retail trade), has led to a great number and variety of such competitors for public favor. Put up in ornamental boxes, they appear on the counters of every grocer and in the show-cases of every apothecary shop; and not unfrequently their actual value is in inverse ratio to the pretentiousness of the package and the price.

As a rule, purchasers are obliged to take the virtue of such articles upon trust, few having the means or the knowledge requisite for an analysis, microscopic or chemical, of the preparations which they are advised to try, perhaps by the family physician, and yet a mistake in this connection may be fatal.

For all young infants, and for adults in many cases of sickness, starch food is injurious; sometimes in being a source of intestinal irritation; sometimes, as in the case of very young children, in furnishing a semblance of aliment without the reality, such children being as unable to digest and assimilate starch as sand. Hence the usual claim with respect to prepared foods of the cereal class is that they are free from or contain very little starch, while they are rich in gluten and other food elements capable of nourishing the sick and the young. To discover how far these claims are well founded, Dr. Ephraim Cutter, of Harvard college and the University of Pennsylvania, has lately made microscopic examinations of something like 40 cereal foods, developing facts of the highest importance to physicians and their patients, as well as to parents having young children. The results of his investigation appear, with numerous illustrations, in the *American Medical Weekly*, and are worthy of study by all who are interested in microscopy or in the nourishment of invalids and children.

Novel Surgery.—An interesting surgical operation was recently performed in Philadelphia, which consisted in the dividing of the tendons of the third finger to give more perfect freedom in piano-playing. This operation is considered of great importance in a scientific point of view. It is well known that musicians have had difficulty in using the third finger with that freedom of force necessary for skillful operation on the piano. This is for the reason that the tendons connecting with the second and fourth fingers form over that of the third, and act as a martingale, restraining it. Professor Zickown, in his researches for a remedy for this difficulty, consulted Dr. Forbes, after having failed of encouragement from other eminent surgeons. Dr. Forbes confidently asserted that the remedy would follow an operation. The musician had in his employ a mulatto who was an expert in music, but who suffered the same difficulties that retarded others. This young man consented to have the operation performed. He was taken to the Jefferson medical college hospital. Two small incisions were made on the back of the left hand, on each side of the extension tendon, and the accessory tendon on each side was divided. The effect was electrical. The finger was at once released from its constraint and given equal facility of stroke with the others, and its strength was increased rather than impaired. It is asserted that the hand will be in no wise deformed by the operation, while the effect is that pupils in music who undergo the process will be in an instant advanced several years in power and facility of operation on the instrument. The colored boy will submit his other hand to the operation in a few days. The success is exciting very marked interest in musical and scientific circles here and elsewhere.

Soft Beds.—Why should soft beds be considered unwholesome? Certainly they afford more comfort than hard ones. Hard beds should never be given to little children, and parents who suppose that such beds contribute to health by hardening and developing the constitutions are surely in error. Eminent physicians—both here and in England—concur in this opinion, and state that hard beds have often proved injurious to the shape of infants. Birds and animals cover their offspring with the softest material they can obtain, and also make soft beds for them; why not do the same with our own young?

Tubercular Disease.—Prof. Tyndal recently contributed to the London *Times* a luminous exposition of Koch's remarkable investigation of tubercular disease, demonstrating by experiments on animals that the disease is caused and propagated by living parasites.

MINING AND SCIENTIFIC PRESS

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A. T. DEWEY. W. B. EWER G. H. STRONG.

SAN FRANCISCO:

Saturday Morning, May 6, 1882.

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Passing Events.

After struggling for years independently against heavy bodies of water, there is now to be a combined effort of the various companies at the south end of the Comstock to overcome the difficulty. The plan proposed we give the details of elsewhere in this number of the PRESS. It is one which will cost a good sum of money, but either this or some similar plan must be carried out, or the lower levels of these mines will have to be abandoned. Levying assessment after assessment, simply to spend the money in pumping, will not pay; nor will the stockholders stand it much longer. We are glad to see now an active movement made.

The Indian troubles in Arizona still continue, but active measures are being taken to settle them.

The President has issued a proclamation calling upon all bands of "cowboys" in Arizona to disperse to their homes. It is to be hoped that some active movement will be made to break up the cowboy nuisance.

We give elsewhere the details of what was done by the anti-debris convention which met at Sacramento this week.

The prospectors are following up the snow line, and as fast as the snow disappears they take possession of the ground.

ON Monday three cars of machinery for the General Custer mill arrived at Ogden from the East, and will be forwarded to Custer City, Idaho, via, Blackfoot.

Boundary Marks of Mining Claims.

In the last number of the MINING AND SCIENTIFIC PRESS we gave some directions as to the proper way of marking locations on the ground so as to comply with the law. One reason for again referring to the subject is that it is of the greatest importance when perfecting the title to the claim when it becomes valuable. The Department of the Interior has decided that an application for a mining survey must be declined where the location was not properly marked and recorded, and that bearings and distances must be given in a survey from the respective survey corners to the location corners, and the same must be shown on the plat.

The act of Congress of May 10, 1872, expressly provides that "the location must be distinctly marked upon the ground so that its boundaries can be readily traced," and "that all records of mining claims hereafter made shall contain the name or names of the locators, the date of the location, and such a description of the claim or claims located, by reference to some natural object or permanent monument, as will identify the claim."

These provisions of the law must be strictly complied with in each case, to entitle the claimant to a survey and patent, and, therefore, should a claimant under a location made subsequent to the passage of the act of May 10, 1872, who has not complied with said requirements in regard to marking the location upon the ground and recording the same, apply for a survey, Surveyore-General are instructed to decline to make it.

To enable the Land Office to determine satisfactorily, and at a glance, that the provisions of the law and its instructions are obsyed, Surveyors-General have been instructed to require in the field notes a particular reference to all the data upon which a survey is based, to wit: From each established corner of the survey a bearing and distance must be given to the corresponding corner of the location. Upon the plat the lines of the location as found upon the ground must be laid down in such a manner as to contrast and show their relation to the lines of the survey. If the location and survey are identical, the facts should be clearly and distinctly stated in the field notes. The Land Office has determined that no survey not complying with these requirements will be allowed to go to patent.

Prospectore who are locating claims will do well to mark them properly, in accordance with law, and save trouble in the future.

A New Amalgamator.

William T. Browne, of Stockton, has just patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an amalgamator which consists in the employment of a mercury-containing pan of considerable diameter, having a second pan or distributer so mounted as to rotate concentrically within it. This distributer has a central feed-pipe passing through its bottom, so that the ore or pulp may pass by gravitation between the bottom of the inner pan and the mercury, which rises to a small hight above the level of the bottom of the inner pan, and thus produces a certain amount of pressure which the pulp must pass. The rotary motion of the central pan or distributer gradually carries the pulp in spiral lines to the outside, where it rises in the space between the two. A scraper may be arranged to move the pulp to the point of discharge.

The pan is preferably circular, and shallow in proportion to its diameter, and it is provided with an outlet at one side. The smaller pan has a central pin, or pivot, upon which it turns on a suitable step in the bottom of the main or outer pan. From the center of this small pan is a feed-pipe, its upper end being adapted to receive the pulverized ore or pulp. This pipe passes or opens through the bottom of the inner pan, so as to discharge the pulp below its bottom. The space between the two pans is filled with mercury, which rises a short distance above the bottom on the outside of the inner pan, so as to produce a certain amount of resistance, against which the ore, or pulp, must enter, between the bottom of the inner pan and the mercury from the feed-pipe.

The operation will then be as follows: Ore or pulp is introduced through the pipe, and when its hight is sufficient to overcome the pressure of the mercury in the outer pan, it will be carried into the space below the bottom of the inner pan. This bottom is flat, and the rotation of the inner pan, which is driven by a belt, will distribute the pulp, and move it gradually, and in curved or spiral lines, to the outside of the pan, where it escapes and rises to the surface of the mercury between the sides of the pans.

The principal advantage that the inventor claims for this method over the ordinary devices for immersing ore pulp in mercury is that it is thoroughly distributed by the rotation of the flat-bottomed distributer and is kept in contact with the surface of mercury beneath the inner pan in a thin sheet and for a long time by this rotation, finally rising to the surface in a thin constant sheet, instead of being projected upward in masses, as is the case where no distributer is employed.

The ore or pulp is not forced into the mercury, as this is open to the objection that, when so introduced, the pressure of the mercury tends to retain the pulp or sand in a mass, which shoots to the surface without any intimate contact with the mercury, except on the outside; and it also has a tendency to entangle and carry off with it some particles of mercury. By this invention the ore is simply distributed in a thin sheet upon the surface of the mercury, and every part is brought into contact with the mercury under some pressure, so that the precious metal will be amalgamated.

Upon the edge of the inner pan is secured a sort of rake, or scraper, which may be adjusted to dip into the pulp around the sides, between the pans; and this rake assists to carry off the refuse which, having passed over the mercury, rises to the surface and is of no longer any value. The rim of the inner pan is somewhat higher than that of the outer one, and the outer one may also be provided with an outlet, so that the refuse may be discharged through it as fast as it is brought around by the scraper and the motion of the pulp and water between the rims and the pans. The rotary motion of the inner pan, or distributer, while gradually carrying the sand or pulp to the outside, also keeps it rolling over and over, and by its action may scour and polish any particles of coated or rusty gold.

Prospecting Quartz Mill.

At the Atlas Iron Works, 135 Beale street, we saw this week Day's vacuum attachment to quartz stamps, which we recently spoke of as having been patented through the MINING AND SCIENTIFIC PRESS Patent Agency a short time since. It is designed to cheapen and lighten the construction of stamp mills, and serve to prospect with, particularly as no great outlay is necessary to purchase one. The inventor, James Day, is prepared to supply mill men and prospectors with light-running mills which are low at first cost, cheap to transport, and can be readily set up in running order.

A mill of this kind is sold for $100, so that miners can select their rock and make a "grub stake;" and, if they are industrious, can make enough to enable them to purchase a larger mill, and fully develop the mine from the resources of the mine itself.

The mill now at the Atlas Iron Works is constructed on the plan and style of our best improved California stamp-mill batteries, with this exception: Instead of having long, heavy and slow-moving stamps, it has short, light and quick-dropping ones. Though these stamps are comparatively light (200 lbs. each), their crushing effect is great, as, by a simple device, they are propelled downward by the pressure of the atmosphere, thus striking a sharp and percussive blow on the rock, similar in effect as though it was shot from the barrel of a gun.

Its operation is as follows: The mill, as before stated, is constructed the same as an ordinary stamp mill; the mortar, stamps, stems, tappets, cams and frame are as usual. To the top of the frame are bolted cross-pieces; on these pieces are laid and bolted the cylinders, in each of which is a piston formed of leather and metal, similar to an ordinary pump; the leather is kept moist and soft by oil; the tops of the cylinders are open, to expose the tops of the pistons to the atmosphere. To the top of the piston-rod is secured a cross-head, in the ends of which are fitted rods. These rods extend downward through appropriate guides on the sides of the cylinder, and are again connected by a lower cross-bar. This lower cross-bar is so placed that the stamp stem will, when it is raised one-half of its required lift, impinge against it and so raise it up. In doing this it raises the piston, and so creates a vacuum in the cylinder. The piston, together with the stamp and stem, is now sustaining the weight of a column of the atmosphere equal to the area of the piston. The continued revolution of the cam carries the stem to its extreme hight. The stamp is then released, and descends with a force and velocity due to its actual weight, and that also of the column of the atmosphere added to it.

These stamps, the inventor informs us, will make 150 drops per minute, if the mill man desires to run them up to that speed. For the purpose of fully showing the value and utility of the vacuum attachment, the mill was operated with one of the cylinders hung up so that the stem did not impinge on its piston. The other had its attachment within working distance of its stem. There is a marked difference in the blow given by the stamp with the attachment on, and that given by the stamp with the attachment off. The one was merely cracking and hardly crushing the rock, while the other was swiftly crushing and making the rock fly.

The inventor informs us that this vacuum attachment can be applied to any form of stamp now running. We will shortly give an illustration of this mill, accompanied with a detailed description of all its workings.

IN the Golden Gate Con., Smartsville, there has been struck some of the richest gravel that has ever been seen in the district, not excepting the famous blue gravel in its palmiest days. This rich gravel was found eight or ten ft. above the bedrock, and they are likely to have quite a depth of it, as the bedrock is pitching from where the strike was made.

A Remedy for Flooded Mines.

It will be remembered that a short time since the managers and superintendents of the flooded mines at the south end of the Comstock met in this city and appointed a committee to suggest a plan for clearing the mines of water, which now floods their lower levels. The committee has made a report, which contains some interesting facts. At the 2700 level of the Yellow Jacket shaft, where the water was found, the influx was at the rate of 2,728,000 gallons a day. At the 2500 level the influx was 2,200,000 gallons a day. At the 2300 level the influx was 1,700,000 gallons a day.

The water is now about stationary at the 1900, showing that the head or level of the water is now about reached. The water was held stationary at the 2,300 level by the Jacket pumps alone, running at seven and two-tenths strokes. The Jacket Co. have pumped and hailed 44 days, during which time they discharged into the Sutro tunnel 52,832,360 gallons, and at the time the pumping and bailing was stopped there was an accumulation in the various drifts, winzes and shafts, from the 3000 to the 2000 level, of 23,018,000 gallons, making a total of 75,850,300 gallons influx during the time of 44 days, or at the rate of 1,723,863 gallons a day, average influx up to that point.

Assuming the influx at the 2700 level to be 2,728,000 gallons a day, the committee finds that that amount of water can be handled by the pumping machinery now on the Jacket shaft, with the assistance of the pumping machinery now on the joint Belcher-Crown Point shaft, provided a drift is run from the Belcher-Crown Point incline to the south laterial drift of the Sutro tunnel, to be used as an adit level, which would allow of the present capacity of those pumps being doubled, with also an additional 10-inch pump being attached to the present Yellow Jacket pumping machinery, and a set of large bailing tanks of a capacity of 1,500 gallons each being provided. The adit level mentioned above will take up all the water coming in above the Sutro tunnel level, discharging it directly into the Sutro tunnel and relieve the pumps of about 180 gallons a minute. The drift will be 2,180 ft. in length, and can be run in four months by working from both ends, by which time the alterations and additions to the pumping machinery at the Belcher-Crown Point and Yellow Jacket shafts would be completed.

After starting the full pumping and hailing capacity of both shafts, it will take about four months to remove the water down to the 2700 level, the point of influx, all of which we estimate can be done for the sum of $450,000. This estimate includes the cost of maintaining the machinery used in good working condition.

As the removal of this large amount of water (414,720,000 gallons) will undoubtedly largely decrease the influx at the 2700 level, the handling of it after that point is reached is a matter left for future consideration.

It has been agreed that the cost should be levied upon the companies in proportion to the number of ft. in their claims. It was ascertained that the ground involved embraced nearly 8,000 ft., and that to carry out the drainage plan it would be necessary to raise something like $460,000, or say $60 a foot. It would not be necessary to raise all the money at once, but it might extend over a period of from six to eight months, and he collected in three or four assessments. The mines involved in the proposed plan are as follows:

Mine.	Feet.	Amount to be Raised.
Bullion	1,100	$66,000
Exchequer	400	24 000
Alpha	300	18,000
Consolidated Imperial	470	28,200
Challenge	90	5,400
Confidence	130	7,800
Yellow Jacket	960	57,600
Kentuck	95	5,700
Crown Point	540	32 400
Belcher	1,040	62,400
Overman	1,200	72 000
Caledonia	1,200	72,000
Total		$451,500

The question of how the money was to be raised was left to the individual companies.

A DISPATCH from Bonny, on the west coast of Africa, dated April 23d, reports that there has been heavy fighting between the natives of New Calibar and the followers of Okojumbo. The latter were the aggressors. The slaughter is described as fearful. At least 2,000 persons were killed. It was feared that the Jaga would take part in the fighting, thus causing a war which would become wholesale carnage. There was much alarm among the English inhabitants. It is expected that two gunboats will be ordered to the scene.

A COAL mine has been discovered on the San Jose river, 43 miles from Albuquerque, N. M., on the Atlantic & Pacific railroad. It shows a vein of eight ft. or more. The mine is only one-quarter of a mile from the railroad.

THE General Custer silver stamp mill has been in operation only 14 months, and it has turned out bullion, the assay value of which foots up $1,400,000, or $100,000 per month.

MEXICANS are making $4 and $5 a day working the placers in Holcomb valley.

Production of the Precious Metals.—No. 7.

An abstract of the Census Monograph on the Bullion output of the country.

Colorado.

From an average annual production of only three or four million dollars, Colorado has suddenly risen to the first rank as a producer of the precious metals among the States and Territories for gold and silver combined, as well as for silver alone, while for gold it holds the fourth rank. In the relation of production to area it holds the first rank likewise for gold and silver combined and for silver alone, and the third for gold alone. In the relation of production to population, however, it ranks only third for gold and silver together, second for silver alone, and sixth for gold alone. The total value of its product during the census year in gold and silver was, in round numbers, nineteen and a quarter million dollars, and, if we add to this the value of lead and copper in crude metal produced, we have a total value of metallic product of twenty-two and three-quarters million dollars.

The collection of statistics of the precious metals in this State presents certain peculiar difficulties. First, from the fact that there are so many small mines which keep no accurate record of their production; second, because a very large proportion of its ores, being essentially heterogeneous in composition, have to be smelted, and are thus more difficult to trace than milling ores. The smelting ores are sold, it is true, mostly to smelters within the State, but the same mine often sells to different and widely-separated works, and the smelters themselves buy ores in small lots from many mines, of which no separate record is kept. Moreover, the check furnished in the more western States over the total production by the express returns is here wanting, since practically the whole silver product is shipped East in lead bullion, of which the transportation companies keep no record. Nevertheless, owing to the almost uniform willingness which the more important mine owners, samplers, and smelters have shown to afford the data which they possessed, it is believed that the totals attained represent a very close approximation to the actual product of the State, and that the figures given are, on the average, within 5% of the true amount, although in districts as yet incompletely developed this percentage may be greater.

To show the data from which the figures given have been obtained, the number of mines from which full schedules were received is subjoined, and the proportion thereof that have been bullion producers during the census year, as well as those producers of which data have been obtained otherwise than by schedules and visits of census experts:

Total deep mines scheduled	249
Productive mines scheduled	126
Productive mines reported otherwise	249
Total productive mines reported	375
Total all mines reported on	498

COLORADO—Production of Placer Mines for the Year Ending May 31, 1880.

County.	Gold
Chaffee	$ 26,357
Clear Creek	3,476
Lake	17,201
Park	20,672
Routt	5,000
Summit	23,979
Total	$101,745

In Colorado, moreover, owing to the fact that other gold bullion is produced so largely, it has been impossible to supplement these figures by express or mint returns. While the above figures doubtless very inadequately express the production of placer gold for the State, it is a fact that this production was relatively small during the census year, owing to the unusual activity in prospecting for and working deep mines.

Copper and Lead—Although these belong rather to the useful than to the precious metals, their importance among the mineral products of Colorado, and their intimate connection with the production of gold and silver, render their consideration here essential. In the table in next column only the crude metal obtained from ores actually smelted within the State is given, no account being taken of the copper or lead contained in ores which were shipped outside of the State for treatment. This amount is, however, of comparatively little importance, forming probably not over 5% of the total product. The lead product was all in the form of argentiferous lead bullion, which was shipped to various smelters in the East to be refined.

The copper product was partly as matte, but largely in the form of copper oxide. Of the actual shipments of the latter, a portion has been produced from ores raised in Montana; a proportionate amount of the total product has, however, been credited to that Territory in its appropriate place.

In calculating the value of these metals, the average market value of either for the year has been assumed as 4½ cents per lb. for lead, 20 cents per lb. for copper.

In the subjoined table are shown the relative amounts of ore treated by mill process and by smelting, and their average yield per ton. Its principal value is to show the average character of ore in each county in reference to its adaptation to either process of reduction. It would have been extremely interesting, had the data been such as would yield accurate results, to have given the assay value of the ore treated in either case, and thus compare the relative losses in either process; but the number of cases in which it has been necessary to estimate product from assay value, or *vice versa*, would seriously impair the value of such comparison. This subject will be found treated at length in the final census report.

(To be Continued.)

COLORADO—Production of Deep Mines for the Year Ending May 31, 1880.

COUNTY	Ore raised during census year.	Average assay value per ton. Gold.	Silver.	Gold and Silver.	Total assay value of ore raised during census year. Gold.	Silver.	Total.
	Tons	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars
Bowlder	7,868	58.17	49.46	107.63	457,613	389,195	846,808
Chaffee	979	20.58	171.64	192.22	20,155	168,032	188,187
Clear Creek	37,031	10.15	52.79	62.94	376,041	1,954,547	2,330,588
Custer	16,034	.91	37.17	38.08	14,594	598,252	612,846
Gilpin	123,668	18.27	5.46	24.73	2,012,134	674,727	2,686,861
Gunnison	252	36.63	721.03	757.66	9,079	181,700	190,779
Hinsdale	2,695	3.07	69.45	72.52	8,269	187,163	195,432
Huerfano	35	20.69	96.97	117.66	724	3,391	4,118
Lake§	152,451	.54	90.04	90.58	82,687	13,726,998	13,809,685
La Plata	12	10.00	246.75	256.75	120	2,961	3,081
Ouray	1,790	41.41	154.31	190.22	74,119	277,103	351,222
Park	5,364	1.36	146.21	147.57	7,291	784,254	791,545
Rio Grande	550	15.50	.....	15.50	8,527	.....	8,527
San Juan	2,725	.73	121.39	122.12	1,995	330,785	332,780
Summit	4,840	3.73	85.88	89.61	18,088	416,170	434,258
Total	356,360	8.68	55.24	63.94	3,091,436	19,693,281	22,786,717

COUNTY.	Ore raised and treated.	Average yield per ton. Gold.	Silver.	Gold and Silver.	Bullion produced from ore raised and treated during census year. Gold.	Silver.	Totals.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Bowlder	7,558.0	40.28	46.82	87.10	304,461	353,851	658,312
Chaffee	161.0	6.33	46.65	52.98	*1,019	*7,510	*8,529
Clear Creek	†35,821.0	6.11	46.73	52.84	*218,756	*1,674,013	*1,892,769
Custer	16,784.0	2.12	10.66	12.78	14,392	72,208	86,760
Gilpin	123,545.0	13.08	2.61	15.69	*1,617,848	*323,321	*1,941,169
Gunnison	252.0	18.11	100.00	118.11	*4,554	25,221	29,775
Hinsdale	2,695.0	2.61	13.09	15.70	5,743	129,236	134,979
Huerfano	5.5	.....	57.27	57.27	.....	315	315
Lake§	140,623.0	.58	89.34	89.92	80,901	12,564,168	12,645,072
La Plata	12.0	8.58	226.00	234.58	103	2,712	2,815
Ouray	1,311.0	12.69	78.55	91.24	*16,631	*102,981	*119,612
Park	5,364.0	.18	95.67	95.85	*951	*513,179	*514,130
Rio Grande	550.0	9.79	.....	9.79	5,385	.....	5,385
San Juan	1,353.0	1.29	104.31	105.60	*1,736	*141,141	*142,877
Summit	4,446.0	1.16	79.66	80 82	*5,168	*354,145	*359,313
Total	330,580.5	6 89	49.20	56 09	2,277,551	16,264.101	18,541,752

COUNTY.	Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year. Gold.	Silver.	Total.	Bullion produced during census year from ore previously raised. Gold.	Silver.	Total.
	Tons.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dol'ars.
Bowlder	310.0	29,416	27,759	57,175	.....	12,266	12,266
Chaffee	818.0	14,644	139,233	153,897	.....	.....	.....
Clear Creek	1,210.0	42,450	172,284	214,734	.....	.....	.....
Custer	9,310.0	.....	409,009	409,009	.....	.....	.....
Gilpin	23.0	374	125	499	236,190	*80,576	316,766
Huerfano	23.5	610	2,860	3,470	.....	.....	.....
Lake§	11,828.0	2,445	1,061,934	1,067,409	.....	.....	.....
Ouray	479.0	30,121	112,603	142,724	.....	.....	.....
San Juan	1,372.0	.....	145,045	147,046	.....	.....	.....
Summit	400.0	4,134	34,650	38,784	.....	.....	.....
Scattered	.....	.....	.....	.....	84,314	190,970	275,284
Total	25,779.5	124 194	2,109,553	2,233,747	320,504	283,812	604,316

*Estimated. †14,384 tons lost by concentration.
‡4,684 tons lost by concentration. §Including the Leadville district.

COLORADO—Crude Bullion Product for the Year Ending Mey 31, 1880.

COUNTY.	Gross Tons.	Lead. Tons.	Dollars.	Copper. Tons.	Dollars.	Gold. Dollars.	Silver. Dollars.	Total. Dollars.
Arapahoe	1,225	.....	.....	980	392,000	.....	.....	392,000
Hinsdale	860	790.00	71,100	.....	.....	5,531	125,254	201,935
Jefferson	1,117	525.75	47,318	598	239,200	213,231	730,514	1,230,363
Lake	28,333	28,226.00	2,540,340	.....	.....	79,177	10,412,947	13,032,467
Ouray	90	89.60	8,610	.....	.....	.....	31,163	39,173
Park	57	56.00	5,040	.....	.....	.....	15,510	33,550
Pueblo	2,191	2,126.50	191 385	.....	.....	27,845	2,013,831	2,233,061
Summit	260	256.00	23,040	.....	.....	.....	13,445	36,486
Total	34,123	32,059.25	2,886,233	1,578	631,200	325,834	13,342,665	17,185,932

Lead, $90 per ton. Copper, $400 per ton.

COLORADO—Production of Smelting Works and Amalgamating Mills for the Year Ending May 31, 1880.

COUNTY.	Ore raised and smelted.	Average yield per ton. Gold.	Silver.	Gold and Silver.	Bullion produced from ore smelted during census year. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Boulder	3,412.0	68.52	47.10	115.62	233,794	160,717	394,511
Chaffee	161.0	*0.33	40.66	*52.98	1,019	*7,510	*8,529
Clear Creek†	9,701.0	11.93	116.26	128.19	115,748	*1,127,854	1,243,602
Custer†	982.0	14.24	64.65	78.89	13,978	63,490	77,468
Gilpin	10,218.0	48.36	28.26	76.62	494,088	288,711	782,799
Gunnison	252.0	18.11	100.00	118.11	4,554	25,221	29,775
Hinsdale	2,695.0	2.01	13.09	15.70	5 743	129,236	134,979
Huerfano	5.5	.....	57.27	57.27	.....	315	315
Lake	140,623.0	.58	89.34	89.92	80,003	12,564,168	12,645,071
La Plata	12.0	8.58	226.00	234.58	103	2,713	2,816
Ouray	1,015.0	6.66	100.62	107.28	6,760	102,133	108,803
Park	5,364.0	*.18	*95.67	*95.85	*951	513,179	*514,130
Rio Grande	.....	.....	.....	.....	.....	.....	.....
San Juan	1,353.0	*1.29	104.31	105.60	*1,730	141 141	*142,877
Summit	3,771.0	.....	03.91	*93.91	.....	*354,145	*354,145
Total	179,564.5	5.34	86.21	91.55	959,377	15,480,533	16,439,910

COUNTY.	Ore raised and milled.	Average yield per ton. Gold.	Silver.	Gold and Silver.	Bullion produced from ore milled during census year. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls	Dollars.	Dollars.	Dollars.
Boulder	4,146	17.05	46.58	63.63	70,667	193,135	263,802
Chaffee	.....	.....	.....	.....	.....	.....	.....
Clear Creek†	11,736	8.78	46.54	55.32	*103,008	*540.100	*049,108
Custer†	1,118	.38	7.88	8.20	413	8,818	9,231
Gilpin	113,427	9.91	.30	10.21	1,123,760	34,610	1,158 370
Gunnison	.....	.....	.....	.....	.....	.....	.....
Hinsdale	.....	.....	.....	.....	.....	.....	.....
Huerfano	.....	.....	.....	.....	.....	.....	.....
Lake	.....	.....	.....	.....	.....	.....	.....
La Plata	.....	.....	.....	.....	.....	.....	.....
Ouray	990	33.35	2.86	36.21	9,871	848	10,719
Park	.....	.....	.....	.....	.....	.....	.....
Rio Grande	550	9.79	.....	9.70	5,385	.....	5,385
San Juan	.....	.....	.....	.....	.....	.....	.....
Summit	075	*7.68	.....	*7.60	*5,108	.....	*5,168
Total	131,948	9.99	5.94	15.93	1 318,272	783 571	2,101,843

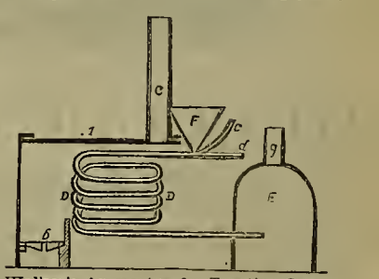
*Estimated. †14,384 tons lost by concentration. ‡4,084 tons lost by concentration.

Walker's Process for Treating Ores.

In the ordinary processes for treating ores by oxidation a difficulty is felt in so holding the pulverized ore in suspension while being treated as to permit the thorough contact of each particle thereof with sufficient oxygen to support the combustion, and in securing at the same time the presence and suitable distribution of the proper amount of oxygen. Thos. G. Walker, of Morristown, N. J., has devised an apparatus for overcoming this difficulty, which we illustrate on this page.

A is an oven heated from the furnace, *B*, and provided with a chimney, *C*. Within the oven is a coil of pipe, *D*, passing from the hopper into the oven, *A*, near the top and passing out near the bottom, discharging into a preferably closed receiver.

The ore to be treated is finely pulverized and placed in the hopper, *F*, whence it passes gradually into an extension of the heated coil, *D*, from which point it is taken through the heated coil by a jet of steam under pressure from the pipe, *c*, and a jet of atmospheric air drawn or forced in from a pipe at *d*. It will be seen that the coil, *D*, has one inlet for the ore, another for the steam, and still another for the air, and that its connection with the steam pipe is an air-tight connection. The air-pipe is let into the coil, *D*, either in advance of or behind the steam pipe. The steam, while serving jointly



Walker's Apparatus for Treating Ores.

with the air as the conveying medium, holds the pulverized ore thoroughly in suspension and distributes it evenly throughout the heated space, thus permitting the thorough contact of each particle of ore with whatever oxygen is present.

For the purpose of holding the ore in suspension steam is considered greatly superior to air by reason of its greater expansive force and consequent carrying capacity that will hold the many particles of ore suspended while they are affected chemically by the mixed air and steam.

By the saturation of the air, which is effected by the presence of steam, oxidation is facilitated, as it takes place more readily in a humid than a dry atmosphere. The constant presence of a suitable supply of oxygen and its even distribution throughout the heated space is insured by the current of air, so that ignition takes place instead of fusion, which latter occurs when the supply of oxygen is deficient or is not suitably distributed.

The heated coil, *D*, having a free discharge into the receiver, renders possible the holding of the ore in constant suspension by the current of steam and air while passing through the heated space, and also enables the operation to be performed continuously as long as ore is supplied to the hopper. The heat within the coil, *D*, suffices to induce combustion of the combustible constituents of the ore when they are in the presence of oxygen. The sulphur, arsenic, antimony and kindred impurities of low oxidizing powers, uniting with the oxygen supplied by the air, are resolved into gases and escape with the steam and all volatile products into the receiver, and thence through a suitable flue, *g*, while the free metal, the oxides and all non-volatile products are continuously discharged into the receiver, *E*.

It is, of course, not new to treat ore in closed vessels, or in the presence of steam in heated vessels. The inventor claims his process utilizes the steam for two purposes: First, as a propelling and suspending medium, and secondly, to aid in inducing oxidation by the moisture which the steam imparts to air.

Steam has also been brought in contact with products of combustion and heated ore. This the inventor disclaims, as the necessary ingredient, oxygen, is not present in such cases, and as the products of combustion, when brought in contact with the ore in the receiving chamber, or in the flue of the furnace, as has heretofore been done, will consume or combine with the oxygen and prevent it from assisting in oxidizing the ore.

The estimated reduction in the public debt for April is about $14,000,000.

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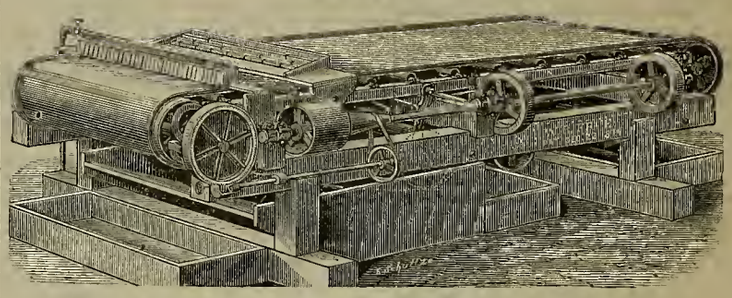

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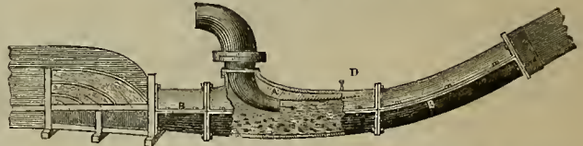

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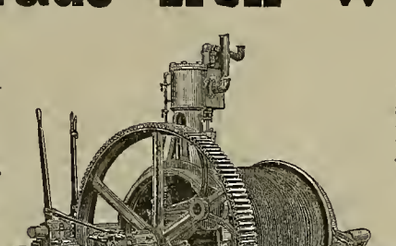

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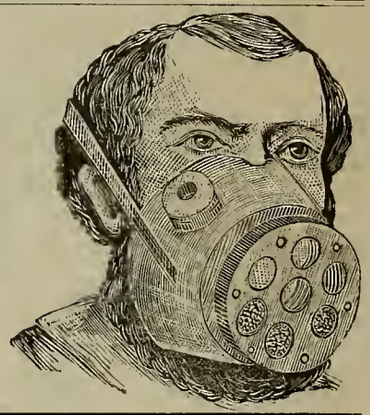

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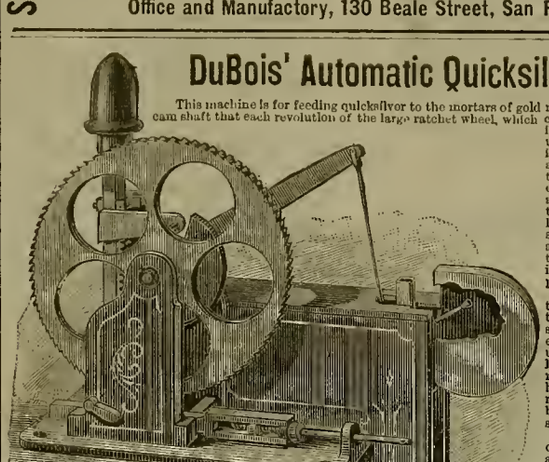
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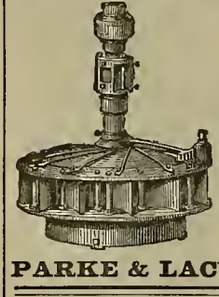
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING APRIL 18, 1882.

256,539—MAIL BAG FASTENING—E. A. Brandau, Los Angeles, Cal.

256,540—REST FOR ROCK DRILLS—Wm. T. Browne, Stockton, Cal.

256,459—FRUIT DRIER—Burnett & Hill, Myrtle Creek, Oregon.

256,467—BUTTER MOLD—Josepb De Carly, Smitb's Ranch, Cal.

256,553—LOGGING ENGINE—John Dolbeer, S. F.

256,555—AMALGAMATING AND CONCENTRATING RIFFLE—George R. Evans, S. F.

256,558—GLOVE—Henry S. Flood, S. F.

256,562—CHAIR BRACE—John A. Gallagher, Chinese Camp, Cal.

256,479—CONDENSER—Wm. D. Hooker, Oakland, Cal.

256,735—SULKY HAY RAKE—W. P. Prall, Colusa, Cal.

256,742—WRITING IMPLEMENT—Samuel S. Rogers, Dayton, W. T.

256,749—ROCK DRILL—William H Silsby, Orleans Bar, Cal.

256,755—SWIVEL LINK—David F. Spangler, Dayton, W. T.

256,604—CAR BRAKE—A. C. Springer, S. F.

256,661—PORTABLE CORRAL—Charles A. Tarragon, The Dalles, Oregon.

256,769—GRAIN CLEANER—Sewall Truax, Walla Walla, W. T.

256 608—FLOATING DRY DOCK—L. C. Watts, S F.

256,524—TEMPERAMENT ADJUSTER FOR MUSICAL INSTRUMENTS—W. K Wheeler, S. F.

256,528—TIRE UPSETTER—Alex. Wornack, Emmetsville, Idaho.

256,464—MACHINE FOR SAWING AND GROOVING SHARES—Frank M. Covell, Olenmoore, Cal.

256 657—SADIRON—John M. Edmonds, Salt Lake, U. T.

256,677—ORE FURNACE—Hall & Haskins, Guerneville, Cal.

FOR THE WEEK ENDING APRIL 25, 1882.

256,946—STEAM ENGINE GOVERNOR—L. W. Andrews, Live Oak, Cal.

256,966—CAMERA ATTACHMENT—Wilfred L. Brown, Mare Island, Cal.

256,876—CAR BRAKE—Jesse H. Burks, Los Angeles, Cal.

256,971—NUT LOCK—J. H. Burrows, Boise City, I. T.

256,831—UNDERGROUND CABLE RAILWAY—Henry Casebolt, S. F.

256,992—SEWING MACHINE ATTACHMENT—A. A. Fisher and A. Hart, S. F.

257,000—STEAM BOILER FURNACE—C. I. Hull, S. F.

257,076—TWO WHEELED VEHICLE—Robert Ross, Santa Rosa, Cal.

257,081—IMITATION OF MARQUETRY BY PAINTING—Wm. Schroeder, S. F.

257,093—ARTIFICIAL TILES—Robert Skinner, S. F.

257,094 SAFE—David W. Smith, Port Townsend, W T.

256,942—FOLDING BEDSTEAD—Charles F. Youngberg, Salt Lake City, U. T.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

STEAM ENGINE GOVERNOR.—Lee W. Andrews, Live Oak, Sutter county, Cal. No. 256,946. Dated April 25, 1882. This governor consists of a two-part cylindrical valve, reciprocating in a cylinder so as to alternately expose and cover ports which open through the sides of the cylinder. The two parts of the valve close against seats at the center, and are caused to close against these seats by springs acting against their outer ends. A rod, which is caused to reciprocate by connection from the engine shaft, passes longitudinally through both parts of the valve, and another rod, which also passes through both parts of the valve, is connected with an oscillating balance-wheel having a coiled spring. The first rod has a collar fixed to it midway between the cross-bars which extend across each part of the valve, and pawls which are hinged to the inner sides of these cross-bars engage this collar at each end, so that when the engine moves slowly, the two parts of the valve move simultaneously, each moving the full stroke without cut-off. The second rod has two arms secured to it and projecting up beside the first, so that their ends are just beneath the pawls before mentioned. When the engine runs faster than the oscillation of the balance-wheel, these arms engage the pawls, so as to lift them alternately clear of the collar, when the exterior openings will close each part of the valve as it is released, and thue cut off the supply of steam to the cylinder.

IMITATION OF MARQUETRY BY WOOD.—Wm. Schroeder, No. 257,081. Dated April 25, 1882. This invention relates to a new and usefnl process for the ornamentation of wood, and it consists in a series of stepe—namely, in preparing the wood with sizing or shellac; in coating or graining it with water colors; in snbsequently removing part of the latter through the openings or stencils to make the proper ornaments or figures; in applying colors through secondary stencils for finishing the designs with darker parts or lines; and, finally, in coating the whole with shellao or varnish. This process of ornamentation is intended to be applied to the cheaper kinds of furniture, and where it is desired to prodnce a fine effect of inlaid work at moderate expense.

SEWING MACHINE ATTACHMENT.—Albert A. Fisher and Albert Hart, S. F. No. 256,992. Dated April 25, 1882. This is a darning and braiding attachment. It consists in a plate adapted to hold and direct the braid, so that it may he sewed on underneath the goods, and thus leave the stamp clear ahove for the needle to follow; and in connection therewith, and in order to render the use of this braiding plate practical and facilitate the operation, it consists further in a peculiar plate secured to the presser-arm, and adapted to he struck hy the oscillating needle-arm in snch a manner that the cloth will he immediately relieved from the presser-foot, and allowed to make sharp turns upon the needle as a pivot point.

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

3776. Auriferous Quartz—Standard mine, Bodie, Mono county, Cal., 385 level. Walter P. Jenney.

3777. Auriferous Quartz—Syndicate mine, Bodie, Mono county, Cal. Walter P. Jenney.

3778. Auriferous Quartz—Bodie mine, east drift, Bodie district, Mono county, Cal. Walter P. Jenney.

3779. Wall Rock (Blue Dyke)—Jupiter mine, Bodie district, Mono county, Cal., 600 level, face of west drift. Walter P. Jenney.

3780. Wall Rock—Syndicate mine, Bodie district, Mono county, Cal. Walter P. Jenney.

3781. Silicified Wood—Dunyea hydraulic mine, Chile gulch, Calaveras county, Cal., one mile from Mokelumne Hill. L. P. Goldstone.

3782. Quartz Crysta's—Standard mine, Bodie, Mono county, Cal. Walter P. Jenney.

3783. White Mica—Black Hills, Dakota. D. T. Hughes.

3384. Genthite, Nickel Gimnite, Hydrous Silicate of Nickel and Magnesia—Oregon; exact locality unknown.

3985. Millerite, with Cobalt (?)—Half a mile from Chico, Placer county, Cal. O. C. Pope.

3986. Trigonia impressa—Jurassic fossil, Bath oolite, Stonesfield, England. (See Geol. Oxford, 181.)

3987. Terebratula maxillata—Jurassic fossil, Bath oolite, Stonesfield, England. (See Geol. Oxford, 181.)

3988. Pecten abrosus—Jurassic fossil, Bath oolite, Stonesfield, England. (See Geol. Oxford, 181.)

3989. Nautilus haberi—Jurassic fossil, Stonesfield, England. (See Geol. Oxford, 181.)

3990. Trigonia moretoni—Jurassic fossil, Bath oolite, Stonesfield, England. (See Geol. Oxford, 181.)

3991. Rhynchonella oh oleta—Jurassic fossil, Bath oolite, Stonesfield, England. (See Geol. Oxford.)

3992. Pecten annulatus—Jurassic fossil, Bath oolite, Stonesfield, England.

3993. Modiola imbrecata—Jurassic fossil, Bath oolite, Stonesfield, England.

3994. Slab with Fossil Plants—Jurassic fossils, Bath oolite, Stonesfield, England.

3995. Pholodomya acuticosta—Jurassic fossil, Bath oolite, Stonesfield, England.

3936 Red Silver Ore—Concordia mine, Bodie, Mono county, Cal. Walter P. Jenney.

3937. Rich Silver Ore—Alta mine, Comstock ledge, Virginia Nev. O. C. Pope.

3938. Pocket Knife—Found at the camp where the emigrants perished in Death valley, Inyo county, Cal. F. F. A. Connelly.

3939. Portion of the Capital of a Rude Column in an Ancient Church—East Cameron mountains, on the road from Santa Fe, New Mexico. The church is built of wood and adobe, and is fast falling into decay. O. C. Pope.

4000. Silver Ore—General Grant mine, New Mexico. O. C. Pope.

4001. Silver Ore—Lookont mine, Lookout mining district, Inyo county, Cal. O. C. Pope.

4002. Ore Containing Free Gold—Caledonia mine, Deadwood, Black Hills, Dakota. Walter P. Jenney.

4003. Fossil Oyster—Gabalan mountains, Santa Cruz county, Cal. O. C. Pope.

4004. Silver Ore—Santa Rita mine, Grant county, New Mexico. O. C. Pope.

4005. Hubnerite—Found in Polsdam sandstone, near Porphyry Dykes, Comstock mine Strawberry district, near Deadwood, Dakota. (See No. 2413.) Walter P. Jenney.

4006. Cerargyrite Crystals (Microscopic)—General Grant mine, New Mexico. (See No. 4000.) O. C. Pope.

4007. Azurite, Blue Carbonate of Copper—Burro mountains, Grant county, New Mexico. O. C. Pope.

4008 Silver Ore—Silver Cliff mine, Custer county, Colorado. D. T. Hughes.

4009. Lava—Mt. St. Helens, Washington T. J. Z. Davis.

4010. Yellow Ocher (Limonite)—Found in considerable quantities adjoining an iron mine (See No. 3765), Campo Seco township, near Campo Seco, Calaveras county, Cal. Valuable as a pigment. C. Berger.

4011. Burnt Ocher—Same as No. 4010. Near Campo Seco, Calaveras county, Cal. C. Berger.

4012. Electrum—Alloy or gold and silver, with chalcopyrite and other minerals. Black range, Socorro county, New Mexico. O. C. Pope.

4013. Portion of a Brick, Illnstrating the McCulloch Process—The Ores are mixed with clay and saw dust and formed into brick, which are then burned in a common kiln—a process similar to one common in the mines of Mexico and South America. The silver treated was from the Comstock. The silver is now in a state soluble in water, and the gold is free. Melvil e Attwood.

4014. Pyrolusite—Lower California; exact locality unknown.

4015. Ore—From Refugio mine, Temescal district, Durango, Mexico. Shows free gold. F. E. Monteverde.

4016. Talcose Rock—Wall rock of the Idaho mine, Grass Valley, Nevada county, Cal.

4017. Slab with Fossils (Carboniferous?)—Georgetown, Mimbres river, Grant county, New Mexico.

4018 Electric Dischargers for Firing Blasts by Electricity—Walter P. Jenney.

4 19. Iron Buttons—Obtain d in crucibles from the Campo Seco iron ore, Calaveras county, Cal. (See No. 3765.) C. Berger.

4020. Gopher Snake (Pitnophis catenifer)—B. & G. Sancelito. Melvi le Attwood.

4021. Oil Painting—(From Raffaelo Sanzio) by Montenegro. Max Burkhardt.

4022. Oil Painting—Lighthouse at Dieppe. Mrs. John H. Holt.

4023. Oil Painting—Tropical Scene in Mexico. Mrs. John H. Holt.

4024. Rock Specimen, Called Soap Rock—San Buenaventura, Ventura county, Cal. J. Z. Davis.

4025. Rock Specimen, Silicious Sinter—Contains 79% of silica. Determination by Dr. William D. Johnson. Silver ores are found in this formation. Custer county, Colorado. (See No. 4008.) D. T. Hughes.

SMELTING FURNACES.—The water-jacket furnaces, for both galena and copper ores, built hy Messrs. Rankin, Brayton & Co., of the Pacific Iron Works, San Francisco, have worked a revolution in the smelting business of the country. The advantages demonstrated in these furnaces are facility and cheapness of transportation and construction, economy of fuel, fineness of hullion produced and capacity for continuous and uninterrupted work. Any ore that can he smelted, it is claimed, can be worked cheaper in these furnaces than hy any other process. The mining interests of the country are largely indebted to the enterprise of this firm for working up to such a state of perfection this important branch of mining machinery. A large number of companies in Arizona, New Mexico and Nevada are operating these furnaces with most satisfactory results.—*Arizona Daily Star.*

News in Brief.

SEVENTY thousand emigrants arrived in New York during April.

CARP have been grown in Los Angeles county weighing as high as seven pounds.

ONE hundred thousand immigrants are expected at Castle Garden this month.

A GREENSBURG, Ind., moh took a prisoner from jail and hanged him for a crime of which he had just heen acquitted.

UTAH furnishes 40,000 head of beef cattle to Eastern markets every year, and cattle raisers have realized about $15 per head.

THE assessment on the broad gauge railway tracks in Colorado amounts to $8,250,000, and the narrow gauge to nearly $7,300,000.

A CHICAGO jury has awarded $3,500 to a tenant whose family was made ill hy sewer gas, the landlord having represented that the plumbing was perfect.

BEE men are making preparations to secure a large yield of honey this year. They all say there have never heen better prospects for their business than this year.

SUGAR cane cultivation bas been developed largely in northern Utah recently, because the sirnps which have been brought from the East are often inferior to the home product.

A REAL estate agent in Chicago says: "There are no cheap houses heing huilt now. Capitalists will not put their money into little cheap cottages while there are no laws for getting possession from non-paying tenants."

THE Board of Trade has adopted and transmitted to Washington a resolution urging Congress to take action towards preserving the navigation of the Sacramento river and the bay of San Francisco.

COINAGE at the United States mint, in Philadelphia, during April, aggregated 4,481,000 pieces, valued at $6 057,300, and made up of 315,000 eagles, 422,000 half eagles, 500,000,000 silver dollars, 433,000 five cent pieces, and 2,500,000 cents.

THE last incoming French steamer brought a numerous party of Frenchmen, who were under contract to proceed to the vine-growing districts of California, where full employment, at good wages, is guaranteed them. Protection gets encouragement from immigration.—*Philadelphia Press, 23d ult.*

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THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

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Any stock upon which this assessment shall remain unpaid on the fifth day of June, 1882, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the third (3d) day of July, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. WM. BLACKWOOD, Secretary.

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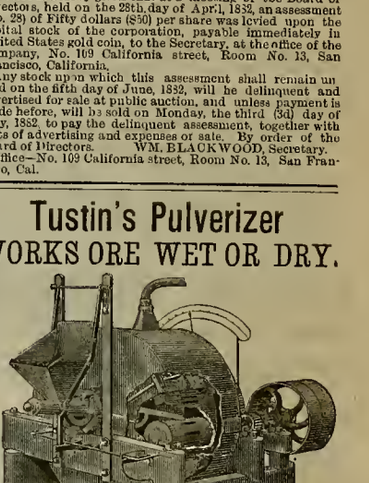

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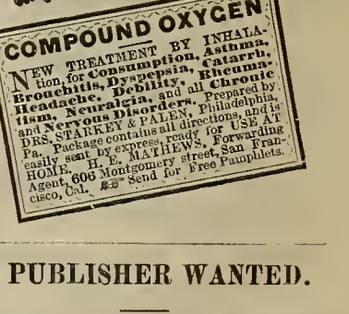
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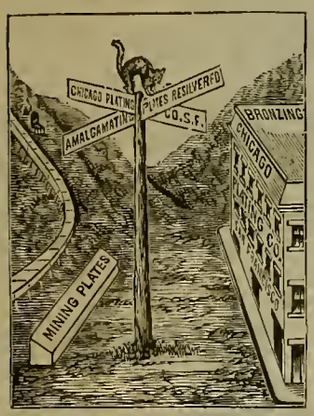

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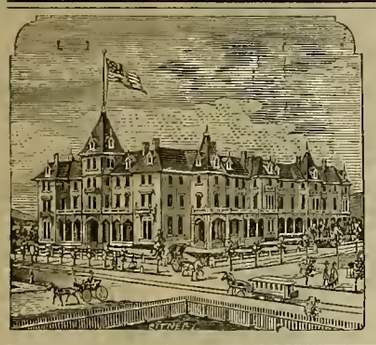

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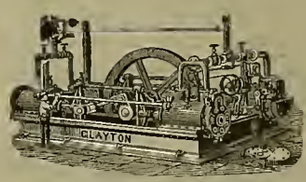

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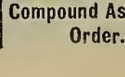

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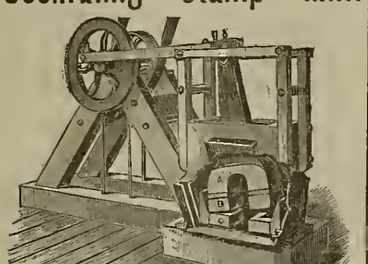
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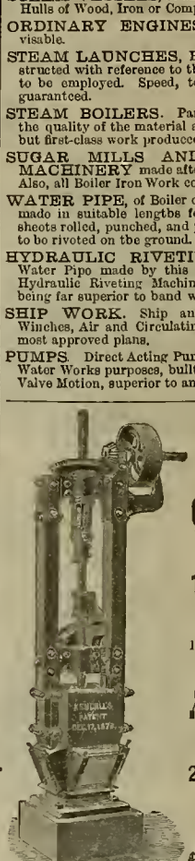
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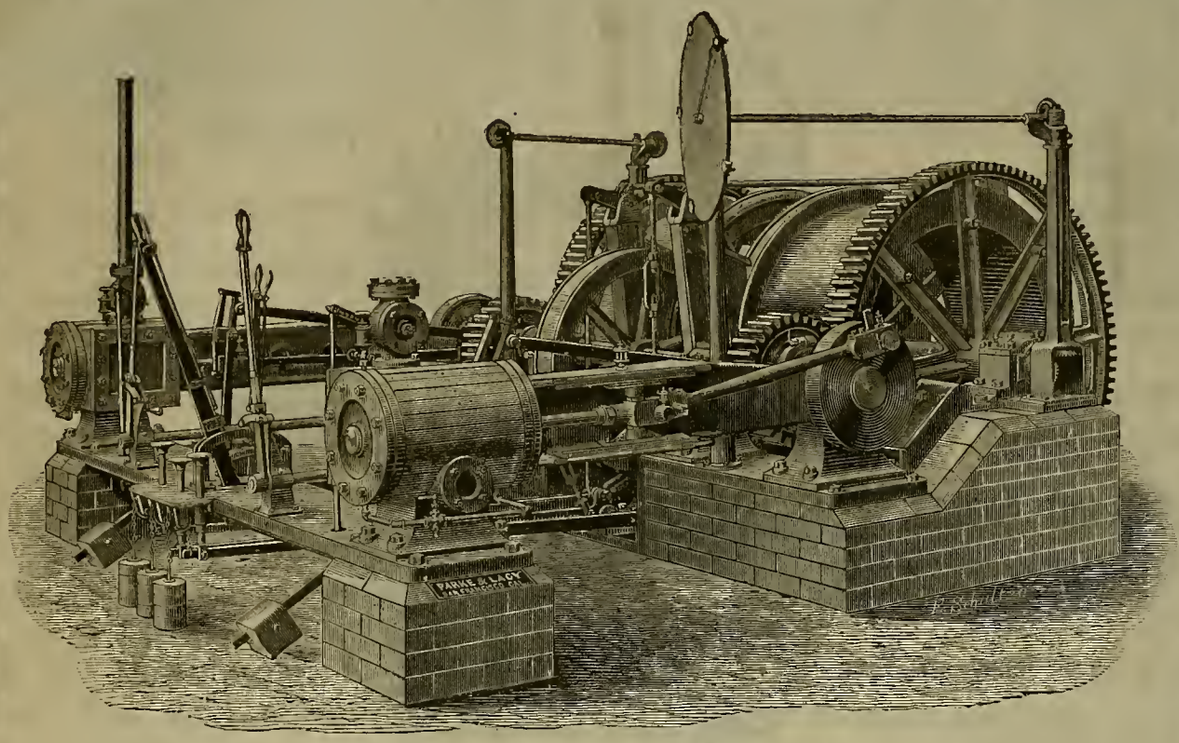

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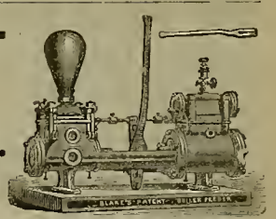

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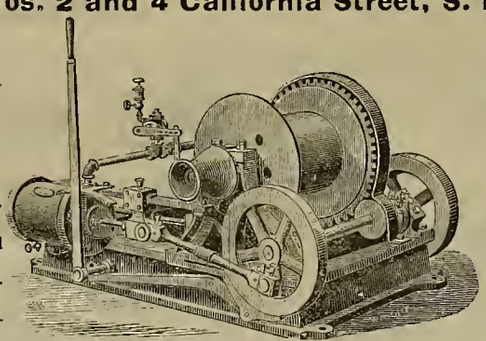

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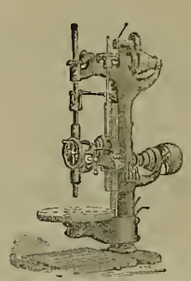

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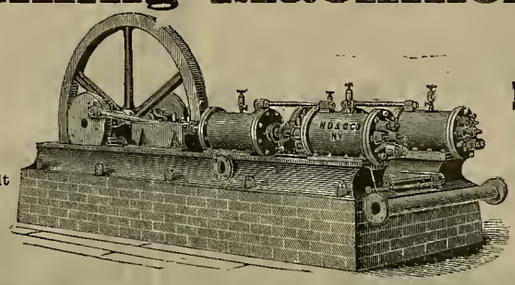

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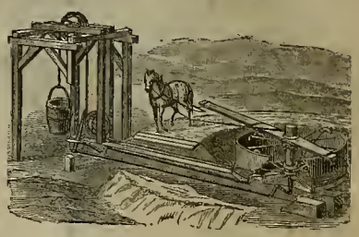

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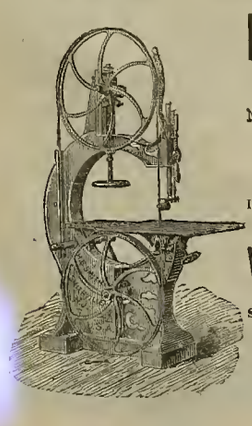

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Mining Surveys in Mountainous Regions.

A rather curious case recently came before the Land Office, in relation to the Land Office regulations about surveys of mining claims when they are in high mountainous regions, inaccessible in winter. Mr. J. S. Wallace, of Hailey, Idaho, wrote to the Commissioner of the General Land Office representing, in effect, that there are mines located high up in the Sawtooth mountains, in new districts near the head-waters of Wood river, and that in case parties should make applications for patents of such mines during the period from about December to April, it would be impossible in a majority of instances, if not in all, for adverse claimants to procure surveys in accordance with present regulations within the period of publication, on account of the severity of the climate, deep snows, etc., in that locality.

In view of these facts, Mr. Wallace, who is acting as superintendent of mining property located in said mountains, suggests that the rights of all parties owning claims in the above mentioned districts would be most effectually preserved and protected, if the Surveyor-general of the Territory was instructed to postpone the granting of any order for advertisement of applications for patents, until the country is open in the spring, when adverse claimants can procure their surveys.

When this letter was received, the Commissioner suggested that the Land Office might issue instructions waiving the present requirements as to surveys of adverse claims in cases in which the adverse claimants shall show under oath that such surveys cannot be executed and platted within the period of publication, on account of climatic or other temporary difficulties, allowing adverse claimants to file such plats of surveys within a reasonable time after the obstacles to making surveys shall have been removed.

The matter then came before the Secretary of the Interior, who did not agree with the suggestion of the Commissioner of the Land Office. He thought that adverse claimants should be held to reasonable diligence under the law in taking necessary steps to protect their interests. If there is danger or likelihood of applications for patents being presented during a season in which surveys cannot be made, the parties might anticipate such proceedings by securing surveys of their claims during the season in which no obstacles to making the same are present.

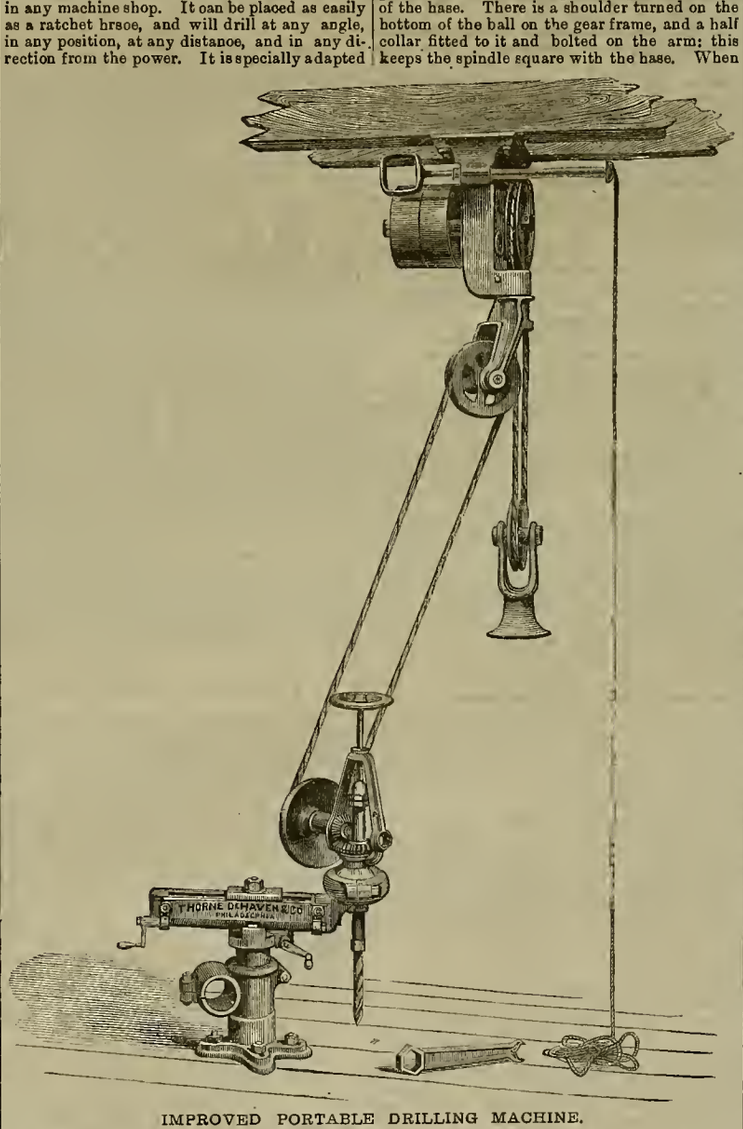
But, if application for patent in any case should be made at a time when it is impossible to secure a survey of the claim adverse thereto, then, as the law does not require impossibilities, the adverse claimant might show the nature, extent, and boundaries of his claim, as nearly as practicable from information within his reach, and present, under oath, his reasons for not following more clearly the regulations, and submit whether, under all the circumstances, he had not properly presented an adverse claim. This would give opportunity to waive the regulation requirement in a given case when the facts were presented justifying such action, and would be preferable to a general waiver of the rule in anticipation of a case calling for any such waiver.

To waive the requirement as to surveys of adverse claims in advance of the presentation of reasons therefor, would tend to encourage carelessness and indifference on the part of adverse claimants respecting such requirement, and would, the Secretary thinks, be equivalent to an invitation to adverse claimants to present excuses for laches, whereas they should exercise all reasonable diligence in their efforts to comply with the regulations.

White vs. Chinese Miners.—The Nevada *Transcript* says: The 26 white men who went to work at the Charonnat mine about three weeks ago, for $2.50 a day, in place of the 52 Chinamen previously employed at $1.50 per day, are proving pretty conclusively that Mongolian labor is dear at any price. The 52 Chinamen used to have hard work to extract enough ore to keep five stamps busy, whereas the 26 white men take out more than enough to keep 10 stamps going.

Portable Drilling Machines.

The engraving on this page represents a patent portable drilling machine, for which Parke & Lacy, in this city, are sole agents for the Pacific coast. The tool is specially useful in any machine shop. It can be placed as easily as a ratchet brace, and will drill at any angle, in any position, at any distance, and in any direction from the power. It is specially adapted to drilling all pieces which are inconvenient to move or which cannot be readily adjusted under stationary drilling machines.



IMPROVED PORTABLE DRILLING MACHINE.

The operation of the machine is as follows: The counter hanger is bolted to the ceiling or other convenient place, and receives power from the "line shaft" by a flat belt on the fast and loose pulleys. The frame carrying the "idlers" rotates on a hollow stud, through which the round belt passes to the grooved driving pulley. The rotation of this frame permits the belt to be led to the drilling machine in any direction, radially, from the hanger, while the rise and fall of the weighted "idler" permits it to be led to any point within the scope of this rise and fall—say 10 to 15 ft. or more. By inserting sections of belt, by means of the hook couplings, any distance can be reached.

The base of the drilling machine is intended to be bolted or clamped to the piece to be drilled. The hight of the post can be adjusted to suit the different lengths of drills and chucks used in the spindle. The radial slotted arm is fastened to the post by the stud and nut; the position of the drill being adjusted by the screw which travels the arm, and the worm and tangent-wheel which rotates it on the post. When it is required to drill parallel with the base, the post is held by the clamp bearing on the side of the base. There is a shoulder turned on the bottom of the ball on the gear frame, and a half collar fitted to it and bolted on the arm; this keeps the spindle square with the base. When this half collar is removed, the spindle can be set to an angle in any direction.

When the drilling machine is not being used on the floor, it serves the purpose of a bench drill press.

In the House a bill has been introduced by Calkins to aid in the making of further Arctic explorations, and detaining Master Lucien Young as commander of the expedition. It authorizes the Secretary of the Navy to purchase a vessel of the proper size and structure for the expedition, at a cost not exceeding $50,000, and appropriates $100,000 for the expenses of the expedition.

A gentleman who came in to Los Angeles from Calico mountains says that a tramp in wandering about purposelessly, unearthed a lump of native silver. Following up the clue, the tramp set vigorously to work, and soon uncovered a lode which, in extent and richness, bids fair to rival the famous King mine.

Ahead of the Miners.

It is evident this country is wrongly made up. The geological conditions are not what they should be in relation to centers of civilization, population and capital. The Creator put granite, sandstone and slate where they wanted it to build big cities, and they built big cities there. But then, he put the kind of rocks containing gold, silver, lead, etc., in an entirely different part of the country. Consequently, how can the citizens of the big cities, for whom, evidently, all the good things of the world are intended, manage the mineral-bearing regions and the mines, without the extremely disagreeable necessity of having to reside outside the borders of civilization, or having to entrust their dollars and property to others?

This simple statement will show that there was an evident lack of foresight in the arrangement of geological and geographical conditions. But the New Yorker, the Bostonian, the Philadelphian and the Chicagoan, each rubbing the side of his nose, said, "Have we not tunneled mountains, crossed oceans and annihilated space, and shall we rest quietly and see these millions taken by the unappreciative and untutored Californian, Nevadan, Oregonian, Idahoan, Arizonian and New Mexican? No, rather will we get to windward of the rough crowd, and take the profits of their mines to ourselves." And with shrewd foresight they thereupon organized mining stock exchanges in each of these cities, and issued small sheets of paper, representing each a certain portion of those said mines whose name they bore; and in a little while the people dealing in these pieces of paper became convinced that *they* were the mines, a fiction strongly encouraged by the said stock exchanges themselves, until finally the stock exchanges said: "What do we want with mines at all. The people are satisfied with the shares; they know about shares and know nothing about mines. Therefore, let us pay our entire attention to the shares."

And thus the object was accomplished, and a mining stock exchange took the place of the mines to so great an extent that capital was directed from the mining districts and kept in the cities among the people for whom money was made. Then, when there was nobody to buy the mines the prospectors discovered, and no money came to the camps, the owners went to the big Eastern cities, there to try to sell their claims. Straightway the people who had the money and not the mines turned up their noses at the rough western ways and snubbed them—termed them adventurers and hummers, and "sat on them," so to speak. Finally, becoming discouraged, these men came back to their prospect-holes, mines and camps.

Then the men who had got the money from the people who bought the shares said: "How about this; can't we get the mines now, too, having sold the stock and starved out the mine-owners?" And they dispatched emissaries who bought the mines cheap from the discouraged mine-owners and took the deeds back. A cry was then raised that legitimate mining was the only kind of mining. Shares were delusions and snares. People should only buy mines. Then the men who had bought mines for $1,000 sold them for $1,000,000, and so made a good thing out of it all around. Having, then, all the money, they cried out against mining of every kind, denouncing it as a speculation and a gambling scheme.

In this way have the accidents of geology and mineralogy been turned to account by the thrifty men to whom the world pays tribute.

Assassination in Ireland.—A profound sensation has been caused by the murder of Lord Cavendish and Under Secretary Burke, in Dublin last week. Gladstone had resolved upon a new policy toward Ireland, had released Parnell and others of the Land League and had appointed Lord Frederick Cavendish as Secretary to carry out the milder policy which had been determined upon. The cold blooded murder of this man who went bearing the olive branch is most vigorously denounced by all true Irishmen, and the cause of Ireland is injured by the deplorable occurrence. The assassins have not been found and it is not known who inspired the deed.

Italian Rocks and Contained Minerals.

(Continued from last week.

3937. Best veined white marble: termed Marmo bianco venato di prima qualita. Vara quarry, Carrara (Massa and Carrara), Apuan Alps.

3938. Veined white marble; termed Marmo bianco venato. Fossacava quarry, Carrara (Massa and Carrara), Apuan Alps.

3939. Veined white marble; termed Marmo bianco venato. Gioia quarry, Carrara (Massa and Carrara), Apuan Alps.

3940. Best veined marble; termed Marmo bianco venato di prima qualita. Massa quarry, Carrara (Massa and Carrara), Apuan Alps.

3941. Veined white marble; termed Marmo bianco venato ordinario. Carrara (Massa and Carrara), Apuan Alps.

3942. Spotted white marble; termed Marmo bianco ordinario moschettato. Gioia quarry, Carrara (Massa and Carrara), Apuan Alps.

3943. Common spotted white marble; termed Marmo bianco ordinario moschettato. Carbonara quarry, Carrara (Massa and Carrara), Apuan Alps.

3944. Best crystalline white marble with yellowish veins. Gioia quarry, Carrara (Massa and Carrara), Apuan Alps.

3945. Crystalline white marble; termed Marmo bianco chiaro ordinario di prima qualita. Canal Grande quarry, Carrara (Massa and Carrara), Apuan Alps.

3946. Crystalline white marble; termed Marmo bianco ordinario di prima qualita. Colonnata quarries, Carrara (Massa and Carrara), Apuan Alps. This marble is translucent when sawed into thin slabs.

3947. Dark bluish-gray crystalline marble with bluish-white markings; termed in the arts Marmo bardiglio scuro. Rocchetta quarry, Massa (Massa and Carrara), Apuan Alps.

3948. Dark bluish-gray crystalline marble with light-colored veins; termed Marmo bardiglio scuro venato. Rocchetta quarry, Massa (Massa and Carrara), Apuan Alps.

3949. Crystalline white marble containing a few gray marking and veins. Termed in commerce, Marmo bianco ordinario di prima qualita. Piastrone quarry, Massa (Massa and Carrara), Apuan Alps.

3950. Veined crystalline white marble; termed Marmo bianco venato di seconda qualita. Piastrone quarry, Massa (Massa and Carrara), Apuan Alps.

3951. Bluish-gray crystalline marble; termed in the arts Marmo bardiglio venato. Capella quarry, Serravezza (Lucca), Valle del Vezza, Apuan Alps.

3952. Crystalline veined marble; termed Marmo bianco venato di seconda qualita. Giardino quarry, Serravezza (Lucca), Valle del Serra, Apuan Alps.

3953. Veined white crystalline marble; termed Marmo bianco venato di prima qualita. Giardino quarry, Serravezza (Lucca), Valle del Serra, Apuan Alps.

3954. White crystalline marble; termed Marmo bianco ordinario. Tramhisserra quarry, Serravezza (Lucca), Valle del Serra, Apuan Alps.

3955. White crystalline marble; termed Marmo bianco chiaro ordinario. Falcovaia quarry, Serravezza (Lucca), Valle del Serra, Apuan Alps.

3956. White crystalline marble: termed Marmo bianco ordinario di prima qualita. Polla quarry, Serravezza (Lucca), Valle del Serra, Apuan Alps.

3957. Commouest statuary marble, from the Altissimo quarry, Serravezza (Lucca), Valle del Serra, Apuan Alps. This marble is much used for furniture. When cut into slabs, it is translucent hy transmitted light.

3958. Veined white marble; termed Marmo bianco ordinario di seconda qualita. Arni quarries, Vagli Sotto (Massa and Carrara), Valle d'Arni, Apuan Alps. This marble is translucent in thin slabs.

3959. Gray marble, with extremely heautiful anastomosing veins and spots, dark blackish-blue (due to the presence of organic vegetable matter?); termed in the arts Marmo bardiglio fiorito (or flowery bardiglio). Luchera quarry, Stazzema (Lucca), Valle del Vezza, Apuan Alps. This is one of the most splendid colored marbles of Italy, and sells at immense prices.

3960. Gray crystalline marble with dark, blackish-blue veinings, more or less, running in one direction. Termed Bardiglio fiorito. Luchera quarry, Stazzema (Lucca). Valle del Vezza, Apuan Alps.

2961. Dark crystalline marble. Termed Marmo hardiglio fiorito scuro (dark, flowery hardiglio marble). Luchera quarry, Stazzema (Lncca). Valle del Vezza, Apuan Alps.

3962. Light hardiglio marble. Termed Marmo hardiglio chiaro. Luchera quarry, Stazzema (Lucca). Valle del Vezza, Apuan Alps.

3963. Spotted bsrdiglio marble. Termed Marmo hardiglio moschettato. Luchera quarry, Stazzema (Lucca). Valle del Vezza, Apuan Alps. An extremely handsome ornamental stone. The only locality in Europe where it is known to exist. Sells at very high prices.

3964. Conglomerate, consisting of fine-grained, crystalline, white marble pshhles, cemented together hy hrownish-red mineral matter. Termed in architecture, Mischio di Serravezza. Rondone qnarry, Stazzema (Lucca). Valle del Vezza, Apuan Alps. This is a gorgeous marble when it is polished for monuments, columns and internal decoration, hnt not for out-door work. It sells at nominal prices, being hard to work.

3965. Conglomerate, consisting of pehbles of fine-grained, crystalline, white marhle, cemented hy peach-colored mineral matter. Termed Msrmo mischio persachino di Serravezza. Rondone qnarry, Stszzsma (Lncca). Valle del Vezzs, Apuan Alps. A magnificent ornamental marhle (see No. 3964).

Palœozoic Group—Cambrian (?) or Lower Silurian (?) Syetem.

3966. Slate. Stazzema (Lucca). Valle del Vezza, Apuan Alps. Used for rooling. May be bad in very large slabs, but is rather soft.

Palœozoic Group—Carboniferous Syetem.

3967. Anthrscite coal. Osiglis (Geoca). Valle del Bormida. Coal basin of Calizzano. Belongs in all probahlity to the millstone gritseries, the lowest memher of the carhoniferous system. The hed is in some places five ft. thick, as at Calizzano.

Palœozoic Group—Cretaceous Syetem.

3968. Pale, flesh-colored limestone; from the neighhorhood of Fano (Pesaro and Urhino), Valle del Cesana. A good building stone.

3969. Impure whitish limestone, very similar to gray cbalk of Eogland; from the neighhorhood of Fano (Pesaro and Urhino), Valle del Cesana. A good building stone.

Tertiary Group—Eocene Syetem.

(Possihly the link hetween the Mesozoic and Cainozoic rocks.)

3970. Dark greenish-gray macigno, a fine micsceous, arenaceous rock, very charaoteristic of the lower tertiary of the Appennines. Fiesola (Florence). Valle dell'Arno. A very useful hnilding and paving stone, muob employed at Florence.

3971. Lead-gray macigno, a rock containing minute, fragmentary particles of mics. Porretta (Bologna). Valle del Reno. A very strong, good hnilding stone, employed at Bologna. Capellini is rather disposed to consider it as helonging to the lower tertiary.

3972. Ash-gray mscigno. Brisighetta (Ravenna). A rook containing minnte particles of mica disposed in parallel series, so that there is great facility in ohtaining it in slahs or flags suitable for halconies and flagstones. It is much employed in neighhoring cities, heing a very nseful material.

Upper Miocene System.

3973. Diaphanous crystalline selenite, forming strata of considerable thickness, with hlackish gray marls. Monte San Donato (Bologna). Used for making plaster.

3974. Pale yellowish-brown molassa. Vergato (Bologna), Valle del Reno. A good ordinary hnilding material, hut soft.

3975. Fine-graiued gray molassa. Vergato (Bologna). Valle del Reno. A hetter hnilding material than the otber variety from this locality.

3976. Crystallized diaphanous selenite; found in the gray marls. From the neighhorhood of Voghera (Pavia), Valle del Po. Used for making plaster.

3977. Serpentine conglomerate, consisting of serpentine gravel hrought down from the Alpine chain by the agency of ancient glaciers during the miocene system (anterior to the glacial time), and subsequently cemented together in an imperfect manner hy calcareous matter; interstratified with grayish miocene marls. Turin (Colline and Torino), Valle del Po.

Pliocene System?

3978. Ash-gray marl of marine origin. Montepagano (Abruzzo Ulteriore primo).

Pleiostocene and Prehietoric Series—Quarternary Syetem.

3979. Serpentine conglomerate. Celle Ligure (Genoa), Riviera di Ponente. It is the detritus of prepalœozoic rocks hrought down to the sea hy ancient torrents.

3980. Compact white travertine, formed hy the secnlar deposition of the mineral matter left hy the sulphnrons spring of the Acqua Albula, Tivoli (Rome). This travertine forms extensive strata of great thickness. It was much employed hy the Romans in the puhlio huildings when they did not use hrick; for instance, for certain parts of the Coliseum. See Jervis' "Gnida alle Acqua Minerale, Provincia Centrali."

3981. Compact peat, from the now drained lake of Bientina, Castelfranco di Sotto (Florence), Valle d'Arno Inferiore. Prehistoric series.

3982. Recent alluvium of the Po. Turin Valle of the Po. This alluvium, derived from the rocks of the Apsnnines, comes from the affluents on the right of the Po. It is absolutely different from the alluvium derived from the Alpine rocks brought down hy the affluents on the left of the Po. Prehistoric series.

3983. Recent contemporaneous peat; very spongy, and showing the organic remains of the reeds and other aquatic plants of which it was formed. Argenta (Ferrars), Valle of the Po.

A Big Day's Cutting.—The Port Blakely mill, at Port Blakely, W. T., owned by Renton, Holmes & Co., on last Saturday, in 12 successive hours, cut 190,000 ft. of merchantable lnmber, and dnring the week closing with that day cut 1,000,000 ft. This is the largest cnt in one day at any one mill west of the Mississippi. The proprietors of this and other mills along the sonnd complain of the scarcity of mill hands.

Gas Jets.—A single plate of perforated zino about a foot square, suspended over a gas jet, is said to retain the noxions emanations from the hurning gas, which it is well known, destroy the bindings of hooks, tarnish the gilding, and vitiate the atmosphere for hreathing.

Glaciers and Red Snow.

In a letter from Visalia in the *Rural Press*, signed "J. W. A. W.," we take the following interesting points:

A Living Glacier.

Few of our citizens have traveled as extensively in the Sierra Nevada of our district as has Mr. Dusy, especially in the regions surrounding Mt. Goddard (14,000 ft.) on the headwaters of the middle fork of Kings river and the south fork of the San Joaquin. He describes as seen last summer hy himself and party, what is more like an Alpine glacier than anything I have seen or heard of in our Sierra, except the living glaciers found hy John Muir on Mt. Lyall. It was six miles east of Mt. Goddard, on what may he called the Goddard ridge—the divide hetween the south fork of San Joaqnin river and the middle fork of Kiogs. It was a mass of clear, hluish ice, estimated to he 80 ft. thick at its upper or deepest edge, where a vast crevice was found, 10 ft. wide, hetween it and the snow above it. It was about a mile long, and from 500 to 600 yards wide. On its edges were moraines, composed of shattered slate, which Mr. Dusy describes as forming there the upper portion of the slope. At the lower end was a great mass of this slaty debris, which was heing shoved along over a substratum of solid granite. He jndged that its movement down the oanyon last summer was about ten ft., as that was the width of the deep crevice on the upper edge hetween the ice and snow. I asked Mr. Dusy if he and his party saw the curious and interssting

Red Snow.

His answer was, "miles of it."

By the way, while lately in San Francisco, I had the pleasure of examining with Dr. Harkness, through his strong microscope, the odd and pretty glohnles of the very small microscopic water plant, *protococcus navalis*, which gives to this snow its red or crimson color. We examined what onr party hrought from the red snow fields of the Kern region, and what Dr. Harkness found last summer on the Wasatch mountains, Utah. These minute glohules appear as round as a ball. The Doctor iuforms me that they propagate hy snhdivision, and that the hest way to prosarve them for examination under the microscops, is to melt a hucketful of the red snow, let the coloring substance sottle, pour off the water and save the red sediment, of which yon will bave ahout a tahlespoonful. Dry this and it forms a pinkish powder, a few particles of which can he moistened and mounted for the microscope at any time. Wbat I had hrought from the mountains had heen kept uncorked for six months in the water melted from the snow. Some glohules from this had retained their red color; others had lost their color hut retained their form. Glohules Dr. H. had dried, had the hrilliant, translucent color of a rnhy. Except in richness of color the glohules from the two localities were exactly alike in shape, etc., showing, as Dr. H. said, that the plants from the Wasatch and the Sierra are identical, and are, heyond question, the veritable *Protococcus navalis*, discovered first in the Arctic regions and then in the Alps, and in late years found in ahundance on many of the higher mountains of Colorado, Utah and California.

Prospectors' Castles in the Air.

It is at this season that the old forty-niner hegins to talk of spots once known to him in California. Every spring he speaks of these pet places; hut they hear particularly heavy on his mind when, as is the case this season, there has heen a great fall of snow, and water will be tumhling down every ravine. He prohably did not think much ahout the spot when he was on the ground—prohably did not prospect it at all—hut as soon as he was out of reach of it the place began to work in his hrain like yeast in a hatch of dough, and time, more than distance, adds to the ferment. He can now see at the distance of 200 miles and after the lapse of thirty years, that in that certain little nook lies the fortune he has always missed securing. He wants to go hack there, and he always tells you he will go hack; not this spring, however; he can't go this spring, hnt next, or at least in two or three years.

You can't pick up an old Californian who has not, treasured up in his memory, such a pet place. He dreams of it hoth hy day and hy night, and of the two his dreams hy night are nrohshly the saner. That spot gives him comfort—is his comfort and stay. While he has it he still has hope. He can see the place just as he left it, and he is always sure that no human feet have measured or human eyes rested upon the ground since he tnrned his back npon it.

The chances are that not one in ten of the ancient miners could go within a mile of the places they dream of, and even though they should reach the very spot, the gronnd would donhtless he found so torn np and dug over that an angel from the realms above could not recognize it.

It is like a page from the "Arabian Nights" when three or four old forty-niners, each with his mug of heer hefore him, start in to astonish each other with stories of the good things they know of the secret places in the old camps of California. Millions on millions are yet resting in these places, and the indications are that their repose will not he disturhed, and that their whereahouts will go down to the grave with the generation who first panned the placers of the Golden State.—*Virginia Enterprise.*

The Shakespeare Parrot Copper Mine.

The Shakespeare Parrot, located a few hundred yards east of Butte, and which was pnrchased some time ago hy Mr. John Longmaid, is rapidly developing splendid productive capacity, and is entering upon a record of what promises to he a long and profitable operation. It is developed by a shaft 260 ft. deep, from which, at a depth of 170 ft., a crosscut 45 ft. long was extended to the ledge. A level east and west having a total length of 100 ft. was thsn driven, following a vein of copper ore, having a uniform width of eight ft. During the nast three months the work of extraction has heen going on at a lively rate, and 2,000 tons of ore have heen hoisted to the surface. Of this amount. 500 toos of first-class ore, assaying from 45% to 50% copper, have heen shipped east in a crude state for reduction, and the remaining 1,500 tons, assaying 20%, are now on the dump. The sinking of the shaft actively continues, and has now heen prosecuted to a depth of 260 ft. In a few days the 270-ft. crosscut will he extended to tho ledge, and the mine will he fully opened up at that depth. Near the face of the 170-ft. crosscut a winze now 30 ft. deep is heing sunk on ore, the ohject heing to make connection with the level to be opened np bslow.

The Longmaid concsntrator, which has heen in process of erection for the past six weeks, a short distance south of the depot, is finished, and the machinery was started into experimental operation yesterday. The 1,500 tons of ore now on the dump at the mine and the other lower grade ore to he extracted, will be treated at the concentrator, the intention being to work it to a value of 40 % preparatory to shipment. The capacity of the works will he about 80 tons per diem. The machinery consists of the usual jiggers and scresns to which has hsen added a patent revolving table, a very ingenious contrivance for the concentration of fine ore, invented hy Mr. Longmaid. The mine is under the supervision of Mr. Alex. Tarhet, who employs ahout 25 men in the work of development.—*Inter-Mountain.*

The Railways and Their Taxes.

It may bs cold comfort to know that the California railways are no worse than those of other States in their efforts to avoid the psyment of just taxes upon their property, hut such is the osse. It is also of interest that in other States, as well as here, strong efforts are heing made to force tbe corporations to shoulder their just share of the hurdens of Government. The *Grange Bulletin* says: In a late suit, in whioh the State of Pennsylvania attempted to collect taxes from the Standard Oil company, from the lawyers on the defense we glean some points as to how great railway corporations are evading taxation. It wss developed that the Atlantic and Great Western railway has escaped all taxation for several years, also the Delaware and Hudson Canal company and other large corporations. The Erie railway got a special act passed, and although it was only asked to pay a tax on the proportion of its road in the State, it has defeated the commonwealth in an attempt to collect the amount. The Auditor-General has the power to tax companies ahont what he likes. When the Standard is asked to pay on its whole capital, tbe Westsrn Union is only taxed an one-thirty-seventh part of its ospital. In this way great favors can he extended to certain corporations. A demand has heen made on the Pullman Car compauy for hack taxes and penalties since the passage of the act. Since 1868 only $550,000 of its capital stock has heen taxed. A similar demand has heen made on the Wagner company. The Americau Meter company, a foreign corporation, is asked for taxes and penalties on four-ninths of its capital stock since 1868.

California Lands.

Mr. Street, Land Officer of the California Immigration Society, in his monthly report to the Board of Directors of the association, made the following statsment relative to the present disposition of the agricultural lands of the State:

"The total area of the State is 100,000,000 acres, a portion of which has been disposed of in round figures, approximating as follows:"

	Acres.
Belonging to or claimsd by railroads, about	25,000,000
Private grants	3,000 000
Indian and Military reservations	300 000
To the Stats for educational and other purposes,	6,500 000
Lakes, bays, navigahls rivers and islands	1 500 000
Swamps and overflowed	1,700 000
Salt marsh and tide lands	100 000
Grand Total	43,600,000

Besides there was a vast amount sold for cash, and disposed of under the pre-emption, homestead and other laws of the United States, ostrainly amounting in the aggregate to several millions of acres.

Ancient River Channels and Ridges.—H. Clsndennen, the "hlind miner," of Randolph Flat, Nevada county, asks us to propound for him the following: Will any man tell us why ancient river channels follow ridges? and, if the ridge is wide, why there is none in the middle? This is a vital question for gravel mining, and, if understood, would save millions of dollars, and I challenge any man in this State to answer the question publicly in a few words. This would be science to some purpose.

MECHANICAL PROGRESS.

Improper Setting of Steam Boilers.

There being no law in regard to the setting of boilers, every one is free to set a boiler as he sees fit. As might be expected, boilers are set with the side or end against the brick wall of a building, so that the side or end cannot be reached. If the brick wall happens to be the wall of a basement or sub-cellar, there will be an accumulation of dampness upon the shell of the boiler, which will start a corrosive action, and in a short time render it dangerous. Boilers are often set resting upon the cast-iron front at one end and a pedestal at the back end, leaving them without any support in the middle. As the iron deteriorates along the seams and becomes thinned by corrosion, it is in time very likely to break in two and demolish the premises. We maintain that all boilers should be so set that all parts of the shell may be accessible for inspection and repairs, and we have yet to hear a substantial reason why this could not be done. We also believe that all boilers over 10 ft. in length should have supports at the middle, instead of only at the ends, as is often the custom.

Boilers could be set more economically, both in the first cost of setting and the use of fuel, if this idea were constantly kept in view. Internally fired boilers should never be bricked over the outside; in fact, there can be no good reason why a single brick should come in contact with the shell at any part. It is well known that where bricks and mortar come in contact with iron, there is almost certain liability to corrosion. We have known of several cases where internally fired boilers have been wholly bricked in, except at the front ends; so that their external condition must be mainly determined from inside examination. We have also known such boilers to explode; and when the shell has been carefully examined, it has been found corroded so nearly through the sheet that pieces could be easily cut out with a pocket-knife.

When a casualty makes the public acquainted with such facts, they are loud in their denunciation of the owners; or, if there happen to be an inspection law in that locality, the inspector has to bear the brunt of their censure. The truth is, they do not consider that, before the explosion, the corroded parts either rested upon or were covered by the brick-work, so that no person could reach them for examination.

Externally fired boilers are often all bricked in, top and bottom; then, if required, the inspector is called in and requested to examine or test the boiler, and make out a certificate. He accordingly goes through the form, but we wish to ask, in all soberness: What does such an inspection amount to? Can an inspector give a conscientious certificate for the safe condition of a boiler carrying a stated pressure of steam, unless he has made a critical examination of every part? He has to trust to his judgment, and, unless he has more than the average of this essential quality in an engineer and boiler inspector, there is great risk incurred.

We saw an exploded boiler some months ago in which the iron appeared to be good. It was stamped as the best; specimens were taken from the ruptured sheets, which, in testing, stood a tensile strain of 48,000 and 50,000 lbs. to the square inch of section. But these tests did not show the fact, that, in the same sheet from which the specimens were taken, there was a badly channeled seam, and the sheet was less than a thirty-second of an inch thick, being corroded where it had been in contact with brick-work.

Test pieces taken from boilers are usually taken from the heart of the sheet, and are not fair examples of the iron in the boiler. Some engineers have placed the life of a boiler at 17 years, and others at 12. We are convinced that no general rules will cover the requirements safely, as some boilers are rendered unsafe in a very few years. A thorough system of frequent inspections will be a great deal more satisfactory.

What is wanted as one of the most essential safeguards against explosions, is a law requiring a boiler to be set so that all parts may be accessible for examination. The top of a boiler may be covered with felting or with a sheet-iron jacket, having air spaces, as is done already to some extent, and with more economical results. When it is desired to inspect the boiler, the covering can be quickly lifted and replaced, involving no expense for repairs.

Until boilers are made accessible, and are properly and thoroughly examined, we may expect to hear of frequent boiler explosions.—*American Engineer.*

Porous Bricks.—The association of proprietors of steam engines in the north of France has made numerous experiments which show that many of the bricks that are employed in building furnaces are so porous as to allow an easy passage for the air. In consequence of these experiments, they advise that no bricks should be employed for the purpose which are not very compact and refractory, and that they should be either glazed upon the outside or covered with an impenetrable varnish.—*Chron. Industr.*

The Modern Sawmill.

Not the least among the wonderful improvements which have characterized the last century are those which have been witnessed in the sawmill. Should some Rip Van Winkle of the last century be suddenly awakened from his long sleep, still dreaming of the old mill which he once worked, and where 1,000 ft. per day was considered a fair average, and be ushered into a modern mill, he would surely think the world was turned upside down—he could hardly believe the evidence of his senses. Says the *N. W. Lumberman:*

The modern sawmill is indeed full of improvements, down to the last device for sorting by machinery. The production in one day, by one saw, of more lumber than was accounted the work of a year in former times, is not only the result of the genius of invention, such as marks the spirit of the age, but has rendered possible the remarkable development of the youngest in the sisterhood of nations, form no unimportant factor in the influence of this country among the people of the earth. All hail to the modern sawmill, and the wise intelligence of nearly every man who is connected with it, either in the production of logs from the forest, or the manufacture and sale of lumber, for each progressive step in the march of improvement has reduced the cost of manufacturing lumber, keeping pace with the inevitable increase in the cost of timber, due to the gradual decadence of the forest.

Belting.—It is economy to put on a wide belt rather than make a narrow one too tight. Vertical belts should be drawn moderately tight. Prof. J. Bauschinger publishes the result of a series of tests of the tensile strength of different sorts of belting made in the Mechsno-Technicsl laboratory at Munich. In making a graphic representation of the results by setting the loads per square inch on a horizontal line and erecting verticals corresponding to the elongations at the different loads, the curves thus obtained show considerable difference for leather, india rubber and cotton belts. All these materials stretch more at first, with light loads, than afterward. The lines, therefore, are more curved at the beginning, and afterward approach more to a straight line. But with leather belts the approximation to a straight line begins at once, and is more pronounced than with india rubber or cotton belts, showing that they stretch in the beginning more in proportion to the load, and possess a high degree of elasticity. The conclusion drawn from the tests by Prof. Bauschinger is that india rubber and cotton belts are inferior to leather, not only as regards elasticity, but also as regards tensile strength, for the same section, and only attain in strength that of medium or inferior sorts of leather. By cementing and sewing the ends, leather straps lose one-quarter to one-third of their strength, if the joints are not made with great care.

Iron Buildings.—Iron buildings often burn, yet wooden buildings may be made fire-proof, and frequently are so built. This statement is worth careful thought by all builders. It shows that an incombustible material is not needed for a fire-proof building. A slow-burning building is always better than the so-called iron buildings. One of the means by which wood may be made fire-proof or slow-burning is the exclusion of the air from it, as by sheathing with tin or covering with mortar. For security, we should have no flues or empty connecting spaces in walls, to carry flame where it cannot be reached by water, nor its exact position known. Floors are fire-proof where the timbers are incased in mortar and the air spaces closed, or where the floor is solid. A layer of mortar between double floor boards makes a floor nearly fire-proof from below, and in a dwelling, quite so from above. Is it not possible to build without making every wall a labyrinth of flues lined with tinder, and giving the utmost protection and draft to a fire that may once start in them? The danger of double wooden walls is reduced one-half when the air spaces are cut off from all connection with each other.—*Carpentry and Building.*

Properties of Malleable Nickel.—We have, on previous occasions, noted the efforts which have been made from time to time to manufacture malleable nickel. M. Garnier, of Paris, claims to have succeeded in making malleable nickel by the addition of 0.3% of phosphorus or manganese. Credit is also due to Mr. Fleitmann, of Iserlohn, Germany, for considerable work done in this direction. He adds one-tenth to one-third per cent. of magnesium, and has found that he can weld the nickel thus obtained to iron and steel and roll it out in sheets, and shape it into tubes and pipes. Dr. Collmann has made a series of tests of the solid malleable nickel produced by the Fleitmann process with the following results: A 0.465 inch round bar showed a limit of elasticity of 59,741 lbs., a tensile strength of 96,083 lbs., with an elongation of 17%, and a contraction of area of 50.6%. A second one, 0.44 inch in diameter, had an elastic limit of 40,609 lbs., a tensile strength of 78,957 lbs., an elongation of 20.25%, and a contraction of area of 45.5%. Nickel wire, 0.01615 inch in diameter, broke under a load of 1,565 lbs.

The Pittsburgh Bridge Co. has orders for 20 new bridges, and work enough ahead to employ its men for four months, day and night.

SCIENTIFIC PROGRESS.

The Development of the Senses.

In the fifth century before Christ, Democritus declared that the senses of sight, hearing, smell and taste, were merely modifications of the sense of touch. Aristotle ridiculed his theory, and so, stamped with his disapproval, it lay untouched for two thousand years, until Telesius, an Italian of the 16th century, revived it.

Strange to say, all that modern science has accomplished in embryology and zoology, tends to confirm this theory of Democritus, that these four senses are only specializations of the universal sense—sense of touch. In the embryo of all animals the organs of these four senses first appear as infoldings of the outer germinal layer, the ectoderm, from which the outer skin also develops. At an early stage they are all simple pockets in the outer covering. If the history of the embryo is to be taken as the miniature of the history of the race—that is, if the individual in its development follows the same course that the race has followed, and it seems reasonable to suppose that this is the case—it is easy to see the importance of this evidence.

In the animal kingdom the sense of touch is universal; it is even found in the lowest animals, the protozoa, which are only masses of simple protoplasm. But, if this animal with its one sense is to become higher, there must be a division of labor; there is too much work for one sense to do properly, and by a quantitative modification this primitive sense is to become qualitatively different in parts, and this qualitative difference is the difference which we notice between the sense of touch and the other senses of the higher animals; it has come about by an accumulation of the sense of touch.

The waves of air which fall on the body of this protozoan as heat are capable of a higher rendering, they will signify more than heat to the proper organ for perceiving them, they will give the sensations of light and colors. The simplest eyes are merely pigment spots in the skin; they merely distinguish heat from cold and light from darkness; but later, by the formation of a lens and sensitive membrane, the external world is revealed in all its variety.—*Popular Science Monthly.*

Relation of Brain Work to Blood Supply.—Even if it is true that the larger and healthier physique affords more blood for brain use, it does not follow that the larger the supply the greater the amount of brain work possible. The argument assumes that the brain has no limit to its activity, except in the quantity of blood that can be prepared for it. But it needs no scientific education to know that there are other influences which limit the thinker's activity, and that these limitations are somewhere in the mysterious recesses of the brain, or in the forces of which the brain is the organ. The physical health of the brain worker may be perfect, his digestion unimpaired, his power to assimilate food the same, and yet he may not be able to concentrate his thoughts or carry on a complicated train of reasoning. The defect is not in his body; that is as healthy as ever; nor is it in any of the processes of blood making—these go on as before. The trouble lies in the brain itself, whose capacity for work is measured by some hidden standard of its own, and which gives warning when a cessation of brain work is imperative. The body is a furnace whose power of consuming fuel is greater than the capability of its boiler, the brain, to generate power. To keep the latter in good working condition, something more is necessary than building and feeding the fires. A supplementary but important consideration is, whether the steam beyond a certain point will not be productive of unpleasant consequences in the form of an explosion.—*Popular Science Monthly.*

Comet's Tails.—Professor Ennis, of the naval observatory at Washington, believes that the tails of comets are electric light. "If these tails had any substance," he argues, "the laws of motion are constantly violated by them. The great comet of 1843 went so near the sun that it passed from one side to the other in a few hours. Its immense tail, 100,000,000 miles long, was shifted completely, so that it pointed directly in an opposite direction. Could that be so if it were composed of any substance? Could a comet swing 100,000,000 miles of tail around as quick as that? The electricity is generated by evaporation. As the comets approach the sun, the heat becomes more intense, the evaporation and accumulation of electricity more rapid, the repulsive force greater and the tails longer. Sometimes the material becomes completely evaporated. Then the comet has no tail."

A Use for Liquid Carbonic Acid.—Krupp, the great gun manufacturer, is said to be employing at his works a very ingenious way of recovering the coils of guns which have become useless. He heats the barrel to reduces and then introduces liquid carbonic acid. The cold thus produced causes shrinkage and allows the coils to be removed.

Platinum crucibles, on being ignited, suffer a greater or less decrease in weight when they are new, but after repeated ignition such changes no longer occur.

God and the Scientists.

The Bible knows nothing of severing nature from God, even in her minutest operations. He is everywhere or nowhere. The falling sparrow, the dying midge, the rounding dewdrop, the headlong tornado share his superintendence. Atheistic scientists are right in their insistence that if impersonal law rules an atom, they have demonstrated the origin and permanence of the universe without a self-existent, eternal, all-directing, Personal Intelligence. But the atom has always fulfilled them, and always will. They can never get done with it. Their deepest wisdom and most searching experiments have always left something unmastered, unreached, unapprehended in every particle of matter to which they ever applied their tests. When they are able to get to the bottom of their bread and butter, it is time enough to proclaim the non-existence of deity. Tyndall and his compeers can no more tell us what is the primary fact of the butter they eat or the coffee they drink, than the baby in the cradle. There is no greater inconsistency in praying than in eating. Tyndall and Huxley, and even the wild and daring Haeckel, and the bold, blasphemous Ingersoll, pray without knowing it every time they eat. They deal with the same mystery in all they do and handle, as that which evokes the Christian's prayer. There is as much room for the petition, "Give us this day our daily bread," as for the scientist's confession of a something that transcends the highest stretch of human wisdom. That something stares the scientist in the face everywhere, with all the attributes which the Bible ascribes to God. The fact of the Divine Omnipresence and the compatibility of prayer with natural law is nowhere more emphatically and comprehensively stated than in these words: "Give us this day our daily bread." Where does law reign more supremely than in the wide circle to which this petition refers? And yet prayer relates to every item in the vast category. Either Tyndall is a blockhead, or Christ was an impostor.

The Author of Nature should know how prayer dovetails into the law of the universe. He should be as wise and competent to reason as Tyndall. When the scientist wishes to produce new results by the voluntary co-relation of eternal laws, he is not hindered or troubled by the consideration of the stability of nature. But when the Christian prays a greater than Tyndall to do the very same thing, whether on a larger or smaller scale, he is pronounced a simpleton. There is not a more inconsistent class of men on God's earth than the God-disowning scientists

The Minute Size of Germs.

It is altogether beyond the power of the mind to conceive the minute size of some of the germs which in their subsequent development work such wondrous changes, and which have such important influences on health and several industrial processes. We read of the experiments of Pasteur, Tyndall, and others, but we seldom realize the infinitely small size of the organisms and germs referred to, for some are undoubtedly so minute that the most powerful microscope fails to detect them. There are some interesting remarks on this subject in a recent number of *Knowledge*, which we quote: "The minute organisms capable of inducing changes analogous to the fermentation caused by yeast, have received great attention of late years and several important diseases are distinctly traced to them. Bechamp estimated that 8,000,000,000 of germs of one micro-ferment only occupied one cubic twenty-fifth of an inch. Not one of these minute bodies could develop except by carrying on complicated processes of a chemical nature, involving very active movements of its atoms and molecules.

The mathematicians have made calculations founded on the pressure exerted by the gases, and other considerations, which show that a particle of the sort of matter, such as albumen and protoplasm, chiefly concerned in life processes, contains in a space of one cubic thousandth of an inch more molecules than any one could possibly form any conception of. Sorby, taking a probable mean of such calculations, supposes one cubic thousandth of an inch of water to contain 3,700,000,000,000,000 molecules. A sheet of ordinary note paper is about one-hundredth of an inch thick. One-tenth of this would, of course, be one-thousandth of an inch, and a little square box of that size each way would hold the amazing number of water molecules mentioned. Perhaps a few thousands of such molecules may suffice for some manifestation of life, but even if many millions should be requisite for the structure of the humblest and simplest germ, we could never expect to see the actual beginnings of life.

Bacteria in the Air.—After a method which he does not describe, P. Miguel claims to have succeeded in counting the number of bacteria in a certain amount of air, and he finds that the same varies with the season. In summer and fall they amount to 1,000 cells of bacteria in one cbm. of air; while in winter, the number of them in a cbm. of air is often only 4 or 5.

An Electric Light Buoy.—A large iron buoy was recently towed from the Government works at Tomkinsville, Staten Island, to the lower bay, where it is to be used to support an electric light. It is fitted with an apparatus intended to convert the power of wave motion into electricity.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Apr. 20		Week Ending Apr. 27		Week Ending May 4.		Week Ending May 11.	
Alpha	1.15	50c	1.10	90c	1.15	1	10c	....
Alta	3.40	2.55	2.55	2.05	2¼	1.95	1.90	1.45
Andes	80c	75c	70c	60c	70c	65c	70c	60c
Albion	2¼	2.10	2.15	2.05	2.15	2.05	1.95	1¼
Argenta	5c	....	5c	....	....	....	10c	5c
Addenda	....	....	....	....	....	....	....	....
Belcher	50c	40c	60c	45c	55c	40c	40c	20c
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	6⅜	6⅜	5⅞	5⅜	5⅞	5⅛	5⅜	5⅛
Bullion	35c	25c	20c	....	40c	20c	30c	....
Bechtel	25c	....	25c	....	30c	....	30c	25c
Belle Isle	....	....	....	....	....	....	....	....
Bodie	6	5⅛	6	5⅛	5⅞	5⅛	5⅝	5⅝
Benton	80c	55c	60c	50c	60c	50c	50c	45c
Bulwer	2.20	2.10	....	....	2⅛	2.20	....	....
Boston	....	....	30c	....	30c	20c	....	....
Back Hawk	10c	....	....	....	10c	....	....	....
Belvidere	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Ca delonia	....	....	....	....	....	....	....	....
California	15c	10c	10c	5c	30c	25c	25c	20c
Challenge	....	....	....	....	25c	20c	....	....
Chollar	....	1	85c	75c	85c	75c	60c	45c
Confidence	80c	....	80c	75c	80c	....	80c	70c
Con Imperial	....	....	....	....	....	....	....	....
Con Virginia	85c	70c	70c	60c	70c	62c	65c	6 c
Crown Point	70c	55c	65c	60c	70c	65c	60c	50c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1.30	1	1.85	1¼	1½	....	....	....
Concordia (Va)	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	1.85	1.65	1¾	1.60	1.80	1.65	1.90	1.70
E Mt. Diablo	15c	10c	10c	....	10c	....	10c	....
Eureka Con	22½	21¼	24	22½	22½	21¼	21¼	21
Exchequer	35c	25c	30c	25c	25c	....	25c	....
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	40c	35c	40c	....	50c	45c	35c	....
Gould & Curry	3.35	3.15	3.05	2.70	2.35	2.35	2.35	2.20
Hale & Norcross	2.10	1.05	1.60	1.40	1.55	1.30	1.30	1.10
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	15c	....	....	....	....	....
Julia	30c	15c	15c	....	40c	....	10c	....
Justice	75c	60c	55c	45c	55c	40c	40c	30c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	....	25c	....	40c	....	25c	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	10c	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1¼	....	1¼	....	1¼	....	1¼	....
Martin White	4.30	4¼	4¼	....	4	....	4.30	4.05
McClinton	....	....	....	....	....	....	....	....
Mono	1.80	1.40	1⅞	1½	1.60	1.35	1⅜	1.20
Mexican	8¼	8	9¼	7⅞	8¼	7¼	6¼	....
Mt. Diablo	4¼	....	4	3¼	4¼	4	4.10	3.85
Morning Star	....	....	....	....	....	....	....	....
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	1.15	1.10	1¼	90c	1.05	1	1	90c
New York	....	....	15c	....	....	....	....	....
Northern Belle	8	7⅝	7⅝	7⅞	8	....	8	7⅝
North Noonday	1	95c	1	....	....	90c	1	95c
Navajo	1.10	1	1.30	1.15	1.55	1.35	1.60	1.45
Occidental	1	....	1	....	95c	....	....	....
Ophir	4.65	4.20	4.60	3⅜	4¼	3.70	3⅜	3¼
Original Keystone	....	....	....	....	....	....	....	....
Overman	30c	25c	25c	20c	25c	10c	15c	10c
Oro	35c	30c	35c	30c	30c	25c	25c	....
Paris	....	....	....	....	....	....	....	....
Potosi	90c	85c	80c	65c	70c	55c	35c	25c
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	2.40	1.90	1.80	1½	1.55	1¼	1.65	1.10
Seg Belcher	1¼	....	2.30	2	2¼	....	....	....
Sierra Nevada	8	7⅞	9¼	6⅜	9⅛	8¼	8¼	6⅜
Silver Hill	20c	15c	....	....	....	....	10c	....
Silver King	17⅛	16⅜	17	....	17⅛	17¼	18¼	18
Succor	....	....	....	....	....	....	....	....
Summit	20c	....	20c	....	....	....	....	....
Scorpion	1	90c	1	80c	1	85c	80c	70c
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	....	....	....	....	....	....	....	....
South Standard	....	....	....	....	....	....	....	....
Syndicate	30c	....	30c	20c	....	....	....	....
Tioga Con	25c	20c	20c	....	25c	....	....	....
Tiptop	4¼	4	4	....	....	....	3½	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	13⅜	11⅞	15½	10⅜	17⅜	12	12¼	10½
Utah	5⅝	5	5⅝	4.65	5	4¼	3	2.40
Ward	3¼	....	2¾	....	....	....	3½	....
Wales	55c	....	55c	45c	50c	....	50c	....
Yellow Jacket	1.10	1.05	1¼	1	1¼	1.15	1	90c

Sales at S. F. Stock Exchange.

Thursday A. M., May 11.

300 Alta	1¼@1.45	475 Union	10¾@10⅝
200 B & Belcher	5½	60 Yellow Jacket	90c
430 Belcher	25c	AFTERNOON SESSION.	
250 Benton	4⅝c	900 Albion	1.90
750 California	20@25c	150 Atlas	1.40
200 Con Virginia	60c	100 Bulwer	2¼
335 Chollar	60c	105 Bodie	5¼@5⅝
450 Crown Point	55@60c	125 Eureka Con	19
155 Gould & Curry	2¼	10 Eureka Tunnel	70c
675 Hale & Nor	1¼	100 Goodshaw	40c
150 Justice	3⅞c	50 Mt Diablo	3¼
10 Kentuck	25c	50 M White	3.30
140 Mexican	6¼@6¼	30 Northern Belle	8⅛
220 Ophir	3.30@3.40	100 Navajo	1.70
1800 Potosi	30@25c	100 N Noonday	95c
1200 Savage	1.60@1.65	200 Oro	25@30c
440 Sierra Nevada	6¼@6⅜	160 Southern Nev	7⅛@7
100 Silver Hill	10c	20 Silver King	17
60 Utah	2¼@2.60	250 Wales	50c

Bullion Shipments.

We qnote shipments since our last, and shall he pleased to receive further reports :

Betty O'Neal, April 30th, $7,412; Silver King, 30th, $25,200; Mt. Diablo, May 2d, $6,548; Contention, April 29th, $19,484; Northern Belle, 30th, $17,707; Union, May 4th, $42,252; Contention, 1st, $11 688; Union, 5th, $56,649; Star, April 30th, $2,456; Christy, 30th, $4,155; Tiptop, May 5th, $9,000; Eureka Con., 2d, $8,539; Eureka Con., April 30th, $26,191; Horn Silver (for March), $23 219; Custer, Idaho (for March), $16,428, also, 62,596 ounces of silver; Indian Queen (for March), $20,440; Northern Belle, May 4th, $5,186; Bodie, 8th, $10,084; Christy, 8th, $1,626; Star, 3d, $1,084; Syndicate, 5th, $5,273; Mt. Diablo, 6th, $8,437; Bodie Tunnel, 10th, $3,500; Betty O'Neal, 5th, $4,281; Contention Con., 7th, $14,881; from Silver Reef (for March), $60,659; Stormont, 1st, $3 500; Hanauer, 1st, $2.350; Germania, 1st, $3,160; Bullionville, 1st, $2,062; Horn Silver, $5,000; Barbee & Walker, 1st, $1,378; Alice, 1st, $20,000; Horn Silver, 3d, $27,500; Bullionville, 3d, $2,020; Stormont, 4th, $3,900; Horn Silver, 4th, $10,000; Tintic, 4th, $1,168; Ontario (for April), $225,000; Mammoth, $4,000; Horn Silver, 6th, $10,000; Bullionville, 6th, $11,938; Horn Silver, 6th, $10,000; Stewart, 7th, $3,500.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	16	50	Mar 20	Apr 26	May 19	Wm Willis	309 Montgomery st
Argenta M & M Co	Nevada	10	10	Apr 12	May 19	June 12	E M Hall	327 Pine st
Alta S M Co	Nevada	23	50	May 2	June 6	June 27	W H Watson	302 Montgomery st
Belcher S M Co	Nevada	30	25	Apr 14	May 17	June 5	J Crockett	327 Pine st
Belmont M Co	Nevada	31	15	Mar 11	Apr 17	May 15	J W Pew	310 Pine st
Belvidere M Co	California	13	25	Feb 9	Apr 12	June 8	C V D Hubbard	310 Pine st
Best & Belcher M Co	Nevada	23	50	Apr 5	May 11	June 2	Wm Willis	309 Montgomery st
Bullion M & M Co	Nevada	23	30	Mar 29	May 2	May 24	J M Brazell	328 Montgomery st
California M Co	Nevada	3	20	Mar 29	May 6	June 5	G P Gordon	309 Montgomery st
Chollar M Co	Nevada	8	25	May 9	June 12	June 30	W E Dean	309 Montgomery st
Excelsior Grav M Co	California	18	25	May 4	June 6	June 23	D B Chisholm	327 Pine st
Fair Villa M Co	Arizona	1	2½	Apr 24	May 29	June 19	J H Sayre	330 Pine st
Goodshaw M Co	California	10	10	Mar 21	Apr 22	May 15	C C Harvey	309 Montgomery st
Hale & Norcross S M Co	Nevada	73	50	Mar 14	Apr 13	May 10	J F Lightner	309 Montgomery st
Napoleon M Co	California	8	5	Apr 20	May 22	June 8	H Smith	307 Montgomery st
Navajo M Co	Nevada	10	20	Mar 7	Apr 27	May 22	J W Pew	310 Pine st
New Coso M Co	California	13	10	Mar 30	May 1	May 22	D B Chisholm	327 Pine st
Niagara G & S M Co	Nevada	6	20	Apr 1	May 3	May 25	O C Miller	403 Montgomery st
Overman M Co	Nevada	53	25	May 1	June 6	June 27	G D Edwards	414 California st
Final Con M Co	Arizona	3	30	Apr 3	May 8	May 29	W W Traylor	309 Montgomery st
Potosi M & M Co	Nevada	8	50	Apr 12	May 16	June 6	W E Dean	309 Montgomery st
Quartz Mountain M Co	California	11	75	Mar 16	Apr 24	May 15	E Hesthes	729 Montgomery st
Savage M Co	Nevada	51	50	May 4	June 6	June 26	E B Holmes	209 Montgomery st
Sierra Nevada S M Co	Nevada	72	1 00	Mar 23	Apr 26	May 15	E L Parker	309 Montgomery st
Silver Lick Con M Co	Nevada	1	05	Mar 29	May 6	May 27	L J O'Farrell	Montgomery Block
Silver Belt M Co	Arizona	1	15	Mar 8	Apr 17	May 15	J W Pew	310 Pine st
Silver Hill Q M Co	California	2	25	Apr 12	June 10	July 1	J W Pew	310 Pine st
Star M & M Co	Nevada	10	10	Mar 22	May 15	May 15	Wm Stewart	320 Sansome st
Tellurium G & S M Co	California	26	10	Apr 1	May 8	May 24	H P Bosh	431 California st
Union Con S M Co	Nevada	19	1 00	Mar 21	Apr 25	May 15	J M Buffington	309 Montgomery st
Villagrana M Co	Lower California	1	20	Apr 25	June 26	July 15	A Judson	320 Sansome st
Utah S M Co	Nevada	29	1 00	May 4	June 10	June 29	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Arizona-Utah M Co	Arizona	2	01	Mar 7	Apr 21	May 12	N C Carnall	320 Sansome st
Caledonia M & M Co	Nevada	12	25	Apr 5	May 13	June 15	W Letts Olliver	323 Montgomery st
Golden Fleece Grav M Co	California	25	30 00	Apr 15	May 20	June 8	F Schirmier	785 Folsom st
Grand Prize M Co	Nevada	8	10	May 2	June 5	June 26	E M Hall	327 Pine st
Holmes M Co	——	4	10	Apr 4	May 8	May 29	E A Holmes	318 Pine st
Lima Con M Co		1	05	Mar 31	May 5	May 31	R D Hopkins	436 Montgomery st
Monumental Tunnel M Co	California	2	05	Mar 31	May 3	May 22	D B Chisholm	327 Pine st
Santa Annita M & M Co	California	3	03	Apr 17	May 22	June 12	J M Buffington	309 California st
South Bodie M Co	California	6	15	Mar 27	May 2	May 25	Henry Deas	309 Montgomery st
South Hike M M Co	Cal fornia	4	10	May 1	June 8	June 28	F A Berlin	420 Montgomery st
Tower Con M Co	Nevada	1	10	Apr 7	May 12	June 1	G W Sessions	309 Montgomery st
Wide Awake P & M Co	Arizona	16	10	Mar 17	Apr 23	May 25	C Hilderbrandte	cor Bush & Kearny
Western Home M Co	——	3	05	Apr 10	May 11	June 15	A Halsey	323 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Con Amador-Volcano H & G Co	Cal	G D Newhall	16 Montgomery Avenue	Annual	May 24
Tilden M Co	——	C Van Dyck Hubbard	310 Pine st	Annual	June 6

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	May 12
Contention M Co	——	D C Bates	309 Montgomery st	25	Feb 28
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	Apr 27
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Apr 11
Silver King M Co	Arizona	J Nash	315 California st	25	Apr 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	May 12

The Mining Share Market.

There is nothing much doing in stocks. With regard to the North End mines our "Mining Summary" gives all there is of interest. At the Union Con. the usual quantity and quality of ore has been extracted from the stopes on the 2500 level. Most of this has been taken ont of that section lying south of the winze. But little work has been done to the northward of the winze, and the indications, found some time ago, of ore making strongly to the west have not yet been followed up.

At the Bonanza mines all is going on about as usual. The drift on the 2300 level from the Best & Belcher and Gould & Curry shaft, which recently connected with the east crosscnt of the Con. Virginia, is being cleaned ont and put in good shape. It gives a good circulation of air. No crosscutting will probably be done in this section until a similar connection has been made on the 2500 level.

At the Savage they are running north along the east wall of the vein on the 2400 level. They keep the drift close against the east side of this wall in order not to lose sight of it. When far enough north crosscnts will be run west. Judging from the ore found to the southward some good ore should be found in running those crosscnts, as the ore is evidently making to the northward. They are also drifting north in a very favorable formation on the 2200 level.

There is nothing doing at the flooded mines. All are awaiting the action of the officers below. It is hoped that a start will soon be made. Men should at once be put to work on the drift which is to connect the Belcher with the south branch of the Sutro tunnel.

At the annual meeting of the Trnstees of the Northern Belle mining company, the dividend was passed for the first time in nearly two years. The managers of the property believe in holding fast to a snrplns.

PROF. OTTOKAR HOFMANN.—Mr. Hofmann's established fame as a metallnrgist, mineralogist and inventor is so widely known and firmly established that his personal movements have much more than a local significance. He came here abont a year and a half ago to erect lixiviation works for the Silver King company. The rebellious character of the Silver King ore required the employment of the best talent in order to produce the best resnlts, and Mr. Hofmann's skill has accomplished a solution of all difficnlties. His services have been in constant demand from several other large mining companies, which his engagement with the Silver King company has hitherto prevented him from considering. We have no doubt hnt his future career will be marked with that success which his reputation warrants. We only regret the departure of Mr. Hofmann, with his interesting family, from Final, and we share that regret with everyhody, as they have gained not only the sincere respect, but the affectionate regard of our community.—*Pinal Drill.*

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

4026. Silver Ore—Ontario mine, Park City, Summit county, Utah, 7th level. Walter P. Jenney.

4027. Silver Ore—Ontario mine, Park City, Summit county, Utah, 3d level. Walter P. Jenney.

4028. Silver Ore—Ontario mine, Park City, Summit county, Utah, 5th level. Walter P. Jenney.

4029. Silver Ore—Ontario mine, Park City, Utah, croppings. Walter P. Jenney.

4030. Cream of Tartar Containing 97⅞ of Bi-tartrate of Potash—Manufactured from California argols. (See No. 4044) Pacific Cream Tartar Works, San Francisco. Ad. Sommers.

4031. Ornamental Inkstand—Of undoubted Chinese origin, being made of agalmatolite, a variety of pinite used by the Chinese for carving figures and ornaments. Found at Lone Pine, Inyo county, Cal., several feet under ground, by Louis Munzinger, in digging the foundation of a brewery, and donated by him.

4032. Gypsum, Satin Spar—Cut and polished. Derbyshire, England. J. Z. Davis.

4033. Rough Diamond—Spring Valley hydraulic mines, Cherokee Flat, Butte county, Cal. Weight, 180 milligrams. Found in cleaning up sluices, associated with zircons, gold, platinum, iridium, etc. Diamonds in considerable numbers have been found at this locality, but none of large size or first water. G. F. Williams.

4034. Black Scorpion, The lyphonus exuhitor—New Mexico.

4035. Quartz Crystals, with Silver Ore—Sinaloa, Mexico. Mark Cornish.

4036. Indian Relics—Supposed to have been used by the Shoshone Indians, Devil's Gate canyon, White Pine, Nev. F. E. Staples.

4037. Pebble of Chalcedony—Which seems to contain a bubble of air or water, or both, but on polishing a similar specimen this appearance was found to be illusive, and is probably owing to the unequal retraction of light. Shoal Water bay, Washington Territory. Charles A. Hughes.

4038. Aquamarine, a Variety of Beryl—Siberia. Prof. H. A. Ward.

4039. Coral Gum, Including Insect—Burmah. Prof. H. A. Ward.

4040. Nephrite, a Variety of Amphibol (Precious Jads of Chinese—China. Prof. H. A. Ward.

4041. Epodite Crystals—Sulzbachthal, Tyrol, Austria. Prof. H. A. Ward.

4042. Agalmatolite or Figure Stone of the Chinese, a Variety of Massive Pinite (See 3004 and 4031)—China. Prof. H. A. Ward.

Meetings and Elections.

SCORPION M. Co.—May 10. Directors—Robert Sherwood, O. F Cnffin, H. F. Cutter, T. J. G. Margetson and J. P. Jackson. At a subsequent meeting of the Board of Directors the following officers were chosen to serve for the ensuing year: Robert Sherwood, President; H. F. Cutter, Vice-President; Geo. R. Spinney Secretary; R. P. Keating, Superintendent. The Secretary showed a balance to the company's credit on the 1st of May of $5,542.45 above liabilities.

MORGAN M. Co.—May 9. Directors—H. J. Tilden (President), Daniel J. Mahoney, Jos. M. Maguire, John A. Freuler, B. D. Bacon. C. L. Tilden, Secretary.

YELLOW JACKET.—At a meeting of the Board of Directors of Yellow Jacket it was resolved to inform the representatives of the mining companies of Gold Hill, Nevada, that it approves the report of Messrs. Patton, Forman and Taylor, and stands ready to pay its share toward the expense of draining the mines represented, as suggested in the report, or as may be advised in any supplemental report of the committee.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

Pioneer Iron Works, May 9. Capital stock, $300 000. Object—To manufacture, purchase and sell all kinds of stoves, furnaces, ranges, cooking utensils and other implements. Directors—Charles Holbrook, J. F. Merrill, J. B. Stetson, W. W. Montague, A. A. Watkins and George A. Low. Each Director subscribes for stock to the amount of $37,500.

Gambetta M. & M. Co., May 9. Location, Inyo county, Cal. Capital stock, $5,000,000. Directors—J. M. Raum, James M. Kane, Henry Krebs, Jr., I. N. Thorne and B. H. Klinger.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

DOWNS.—Amador *Ledger*, May 6: The mill of this mine has come to a standstill, not because of any exhaustion of ore bodies, but because the further efficient development of the property demands the sinking of a new shaft; and this is the enterprise that the management has now in hand. The company has purchased the hoisting machinery at the north shaft of the Oncida mine, and S. L. Breese, one of the best mechanics in the county, is now engaged in taking it down, preparatory to removing it to Volcano. It is expected to have the machinery on the ground some time next week. The new shaft will be perpendicular to the depth of 500 ft, and will strike the ledge somewhere about that depth. It is located about 300 ft north of the old shaft.

THE KELLY MILL is still pounding away on the ore from the tunnel. It is said by parties who have inspected the milling, that the rock, though of low grade, will pay more than expenses. Connection between the tunnel and shaft is expected to be made about the middle of this month.

CALAVERAS.

DOUGLAS FLAT.—*Mountain Echo*, May 5: Reports from the Douglas Flat mining region are very flattering.

CHISPA.—An Indian picked up a chispa on Six-Mile creek the other day, valued at $25. Foindley & Co. are arastrsing ore from the Dock Hill mine, which, it is said, pays them well. Work has been resumed on the Jones mine, which is situated at the mouth of Carson's creek, near Stanislaus river.

DITCH.—The owners of the Jupiter mine, near Dogtown, are digging a ditch to bring water to their claim, which, when completed, will be nearly 5 miles in length.

CLEAN-UP.—A $1,500 clean-up was made at the Gold Cliff mine this week, being the result of 17 days run. Pretty fair for a 10-stamp mill. We are informed by the superintendent of the Gold Cliff mins that a new mortar is to be put in the battery, and other necessary improvements made before starting up again.

AT WORK.—The Rasberry Bros. are busily engaged working their mine. The shaft is down about 20 ft, and the vein is from 12 to 18 inches in width. The ore yields from $12 to $15 per ton.

THE BLACK OAK MINE is still being vigorously worked, and the vein is becoming richer in gold daily. The tunnel by which the mine is worked is now about 80 ft into the hill and is well timbered. The owners of this mine intend sinking a shaft at the end of the tunnel, where the vein is nearly 3 ft wide, and prospects from 15 to 25 cents per pan. The quartz is of a light brown color and is highly impregnated with pyrites of iron.

DEL NORTE.

MINING PROSPECTS.—*Record*, April 29: The time will soon come when prospectors will be starting out into the foothills and mountains with pick and shovel to commence their summer's work. We anticipate some rich discoveries in this county during the summer, as a great part of the country remains unprospected, and the discoveries made last summer will have a tendency to bring hither miners of experience. A rich strike was made late in the fall by the Del Norte Gold Quartz Mining Co., but the season was so far advanced when the strike was made that but little work was done afterwards, but we presume that work will be resumed as soon as the weather settles sufficiently to work to advantage. Mr. Truett, manager of the copper mine known as the Condon mine at Big Flat, we hear, has purchased smelting works which will arrive and be put up at the mine as soon as spring opens sufficiently for the work to be prosecuted to advantage. The Big Flat gravel mine has been lying idle since the legal difficulty arose a year or two ago, which we believe was never settled. The Mountaineer Co., also situated at Big Flat, is composed of a set of go-ahead fellows, all old miners, but have been kept back by the Boston Co., who, report says, was determined to force them off their claims, but it seems did not "make the riffle." This company we may expect to hear from this spring, for their ground is said to be rich, and the "pay dirt" inexhaustible. The French Hill mine is said to be as good a paying mine as there is in this vicinity, but some difficulty having arisen in regard to the legal ownership, it has not been worked to any extent for some time. The great difficulty in placer mining in this county has heretofore been that extensive operations have been carried on by those who had had hut little or no experience in the business, and as a natural consequence expended large sums of money unnecessarily, and the result was a "crash" before the mines could be made to pay.

EL DORADO.

RICH.—Georgetown *Gazette*, May 5: T. Z. Armstrong has gone to work upon the Rich gulch seam mine with his partner, Mr. A. Baldwin, Mr. Adams' lease of his interest having expired May 1st. Adams done very well out of his year's lease, having cleared his $7 a day. The season on which Adams and Baldwin took out upwards of $5,000 last month still continues to pay good wages. John Corwin and P. H. Spencer brought in town yesterday 24 ounces of gold, the result of 3 days work on their placer claim a few miles from town. This mine is yielding handsome returns right along, equaling in richness the placers of early days. They have a considerable extent of channel yet to work, and have every reason to expect big pay for months to come. We are glad to learn that Walter Crover has struck some very rich prospects on the extension of Jordan & Zombro's quartz claim, a few miles southeast of town.

FOR some time past we have understood that T. F. Lewis, of Spanish Flat, had a quartz mine at the foot of Slate mountain, some 15 miles southeast of Georgetown, which yielded flattering prospects, but was requested not to speak of it until he had made some developments. Mr. Lewis is now satisfied that he has a good mine and one which promises permanency. He has a large mortar and works the pestle with a spring pole. He made a number of tests; one of 800 lbs. yielded him $21 and one of 500 lbs. $6 The pay seam varies from 10 to 15 inches in width, and the above results are considered a fair average of the rock. He has gone down 20 ft.

MARIPOSA.

THE YOSEMITE QUARTZ MINE.—Mariposa *Herald*, May 5: This mine, long and familiarly known as the No. 9, under the present management is rapidly taking rank as one of the very best paying veins in our county. The property belongs to M. Hulings & Co., and is under the immediate superintendency of Mr J. F. Thorn. Mr. Thorn formerly owned the mine, and knows how to work it to advantage. Prior to his assuming charge of the works, the mine was run at a great loss to the proprietors. Mr. Thorn has had sole charge of the property for over 7 months, and instead of being run at a loss it commenced paying a handsome profit to the owners from the day he took charge and has steadily increased in its yield, with prospects of paying still better as sinking on the vein progresses. We understand that the rock from the bottom of the shaft and lower levels crushed during April paid nearly $13 per ton, and that the expense of mining and milling the ore did not exceed $5 per ton—that the net profit to the owners during that month from the vein was not less than $8,000. This mine is a great benefit to the people in the west side of the county. It is safe to say that there are at least 100 low-grade mines in this county which could be made to pay handsomely if the owners would have the good sense to employ as practical and experienced a miner and mill superintendent as Mr. J. F. Thorn. In his selection, Hulings & Co. exhibited sound judgment, which other mine owners would do well to emulate. The success of this mine is due to good management alone.

IN GRUB GULCH the mines are steadily being developed. Messrs. Francis, Parker & Marsh, from Merced, have just erected an 8-stamp "Sweepstake" quartz mill on their mine. They are enterprising men, and all wish them success in their new undertaking. Harry Berman has just uncovered a 6-inch ledge of very fine milling ore, which is supposed to be the south extension of the Gambetta; and if prospected to the same extent, I think will prove to be a valuable property. The King's Gulch mine, owned by James Hamilton and others, is being developed with all energy. They have 2 shafts 70 ft deep, and are drifting to connect both shafts. They have a large body of rich milling ore in sight. This can truly be said to be a very valuable piece of property.

ASSESSMENT.—The Mariposa Land & Mining Co. of California has levied an assessment of $10 per share on the stock of said corporation, payable immediately. We hear through the most reliable sources that the property will be redeemed ere long, and the various works of the company will again start up. This will place our county on the same footing as a few years back.

NEVADA.

THE FORD & MULLEN MINE.—Grass Valley *Union*, May 7: A crushing of 14 loads of rock has just been made at Southern's mill from the Ford & Mullen mine, on New York hill and the company were calculating to have the crushing finished yesterday. Beside the regular crushing, some 8 boxes of very fine specimens were sent down to the mill yesterday morning to add to the gold in the general clean-up. A Union reporter saw some of these specimens, and they are as fine and rich as any ever taken out of Grass Valley's hills. The mine is looking splendid and there is every indication that there is plenty of gold yet in the little mine.

THE WASHINGTON MINE.—Work at the Washington mine is being prosecuted with vigor, and George Mahnhart has just been awarded the contract of running the north drift. The rock improves as the drift is run north, and some very fine rock was taken out of the mine on Thursday, showing an abundance of rich, heavy sulphurets and considerable free gold, one specimen found being very rich. The company has great confidence in the mine, and will take out a crushing of 100 tons or more, when in all probability a mill will be erected. The Washington gives every appearance of soon developing into a first-class mine.

PLUMAS.

THE RESERVOIR.—Greenville *Bulletin*, May 3: The Round Valley reservoir is now full to within 14 ft of high water mark. As the water rises the area covered is much increased, and, of course, the daily rise decreases, or would do so if the flow of water into the reservoir remained the same; but during the past few days the various streams flowing in have increased in volume, so that the daily rise is about the same. There is still an immense body of snow on the ridge between Round valley and Soda creek; parties going over some days ago found about 4 ft in the road.

GOLD STRIPE MINE.—The road to Gold Stripe is now opened so that teams can pass over it. On last Friday the butcher made the first trip since the snow season set in. On Monday there were 4 ft of snow on the flat at Wolf Creek village, and on the ground of the Goodwin ledge there were 5 ft. As soon as it is possible to haul rock the mill will be started, but from present appearances this cannot be done short of 3 or may be 4 weeks yet.

CHEROKEE MINE.—The Cherokee mill ran 15 stamps the last half of the last month. A clean-up was made on the 1st inst., Monday, and the results were found to be much better than any during the first half of the month. The remaining battery will be started up by the end of the present week.

TRINITY.

ANIMATED BIDDING.—Trinity *Journal*, May 5: The referees' sale of the Connor Ditch property on Red Hill which took place last Monday was an interesting event. There were in reality but two bidders, Messrs. Lorenz, Bartlett & Evans on one side and Barthel & Henry Jacob on the other. The ball opened with a bid of $5,000 and was rapidly passed from one party to the other, the bid being increased in amounts varying at times from $9 000 to as low as 5 cents rise, until it finally reached $29,020 bid by Mr. H Lorenz and at once increased to $30,00 bid by John Waldron, to whom and at which figure the property was knocked down. Mr. Waldron then undertook to withdraw his last bid in favor of Lorenz, but this was declared "out of order." As Mr. Waldron failed to comply with the "Terms Cash" proviso of the notice of sale, the referees have been forced to again offer the property for sale. The date has been fixed for Wednesday, May 31st.

NEVADA.

WASHOE DISTRICT.

NORTH END MINES.—*Enterprise*, May 3: The outlook at the north end is very encouraging at present. In the mines can be found no reason for the recent fall in the price of Union and other stocks in that section. On the 2500 level they have now stoped out a space of ground 80 ft in length and from 2 to 5 sets of timbers in width. The sets are about 5 ft in width. In going southward at this point—which is 25 ft below the 2500 level—the ore body is found to grow both wider and richer. The vertical winze sunk in the sill floor of the stopes is down 24 ft and is all the way in fine ore. This ore still continues at the bottom, with no sign of a west wall. Thus, the body of ore is known to extend from the 2500 to a point more than half way down to the 2600 level. The bottom of this winze is so wet that work in it has been stopped for a few days in order to allow it to drain out. On the 2600 level the northeast drift from the bottom of No. 1 winze is approaching the point where it is expected that the ore body found on the 2500 level will be cut. The face of the drift was yesterday showing vein material of an improved appearance—much clay and quartz—and the indications are that the ore body looked for is not far ahead. The inclined winze from the bottom of winze No. 1 (the wet winze) is passing into ground that is full of small seams of quartz, all of which appear to be mineral bearing, as the dirt as it comes out yields assays of from $2.50 to $5. If this shows nothing else it is proof that the ground that is being explored is of a fertile character—ground in which ore can live. East crosscut No. 1, on the 2700 level, is passing through a very promising formation of quartz, clay and porphyry, which appears to indicate its near approach to ore. Just where the ore may be from the present face of the drift it would be hard to say. It may be ahead or it may lie either north or south of the drift. Explorations in various directions will presently solve this question. We shall soon know more about the north end mines at depth. The north and south drifts on the 2700 level of the Mexican will be connected in two or three days, as they are now so close together that men can be worked only on one side; and when this is done the ore found in Mexican some time since on this level will be thoroughly examined. One streak 3 or 4 ft in width of good milling ore has already been cut, and before work was discontinued at that point a crosscut was started west in search of the main ore body. This week, also, will be completed the station at the 2000 level of the Union and Sierra Nevada joint winze. This will allow of the starting of exploring drifts and crosscuts at that great depth, and will also drain out the water that is impeding operations at points below the 2500 level. Because ore is not found within 10 ft of the place where it was supposed to be, or just to the day when its discovery was looked for, stockholders should not lose courage; they should bear in mind the vast width of the vein and the many waves in stratification and changes of dip that are liable to occur in the underground regions.

UNION CON.—*Enterprise*, May 7: On the 2500 level are stoping out ore. The winze in the stopes has been run 4 ft. On the 2700 level crosscut No. 1 has been extended 44 ft. In the joint Sierra Nevada east winze have completed the station and started a joint west crosscut. During the week 606 tons of ore have been extracted from the 2500 level, and 436 tons and 1,340 lbs have been sent to the mill. Amount of bullion shipped, $56,049.06.

ALTA.—The diamond drill reached 112 ft in the main east drift, when considerable water was found, so much, in fact, that it was deemed advisable to allow it to drain off before extending the drift further. An accident to our pump in the early part of the week detained us 24 hours. We hoisted 407 cars; wood consumed, 108 cords; strokes made by pump, 71,800.

YELLOW JACKET.—The water in the mine is to day at a point 406 ft above the 2300 level station, having risen 9 ft since last report. At the Winters' shaft have opened the old third station and are in 15 ft from the shaft. We find the station and drift badly caved and filled with rock. The next station (940 ft from the surface) is in 10 ft from the shaft. Are repairing guides and timbering below that level to reopen the old 1028 level.

CALIFORNIA.—On the 2700 level the main south lateral drift has been advanced 28 ft. The joint Con. Virginia east drift, No. 2, has been advanced 15 ft, and is being timbered up.

MEXICAN.—On the 2700 level the main south drift has connected with the main north lateral drift. On the 2900 level the diamond drill has been started in the face of the main north drift; are also cutting out a drain.

SIERRA NEVADA.—On the 2700 level main north lateral drift No. 1 has been advanced 21 ft. North drift No. 3 has been extended 27 ft. The station in the joint Union Con. east winze is completed and a west crosscut has been started.

CENTRAL DISTRICT.

LOOKING WELL.—*Silver State*, May 5: S. W. Hammand, of Central district, is in town. He says the mines down that way are looking well. Frank Clark is putting in his spare time on his mill, and will get it running before a great while. M. S. Thompson is at work on the Marietta, getting out more or less good ore.

COLUMBUS DISTRICT.

MOUNT DIABLO.—Caodelaria *True Fissure*, May 6: The work of extracting ore from this mine has been discontinued for the present, and that of prospecting is being resumed very energetically. Work at the bottom of winze No. 1 has been commenced, and there is a good body of $34 ore in the bottom. Bullion shipments were made on April 29th amounting to $8,467.39, and on May 2d valued at $6 458.35. The total output of bullion for April was $69 954.65.

NORTHERN BELLE.—The general appearance of the mine is much the same as last week. Both mills are running steadily and doing the usual amount of work. Bullion shipments for the week ending May 4th amounted to $13,387 24; and aggregate $60,085.27 for April.

ESMERALDA DISTRICT.

HUMBOLDT HILL M. & M. CO.—Esmeralda *Herald*, May 6: Good progress has been made on the mine this week. The north drift on the 1st level has been advanced 12 ft. On the same level the crosscut from the main shaft has been run 14 ft west to the hanging wall. There is now 200 tons of ore on the dump and 100 tons broken in the mine. They will commence hoisting early next week. The mill was started on Wednesday for the first time since the big storm. Gov. Blasdel has been fortunate in securing the services of Mr. Coombs, an experienced mill man, as foreman of the mill. By having such a man in charge it will enable the Governor to devote his personal attention to the mining department.

GARFIELD DISTRICT.

THE PROSPECTORS DISTRICT.—Esmeralda *Herald*, May 6: Probably there is more attention being paid to this new mining field just now than any district in Esmeralda county. In more ways than one it is deserving of notice at our hands. The ores are very rich, the claims easily worked, and their accessibility and nearness to the C. & C. railroad. In fact it may be justly termed the prospectors' district. The only drawback is water, which is carried in barrels from the railroad company's well at Luning, a distance of 7 to 10 miles. The ledges crop out boldly, and the ore pays from $20 to $1,500 from the surface. As yet these are but mere prospects, not sufficient work being done to call them mines, though the owners hold them at high figures.

JOHL & MCDONALD'S are the best developed claims in the district at present. At the 80 level of the Lottie they are now drifting and stoping ore which assays from $100 to $1,500 per ton. A tunnel is also being run to tap the Lottie ledge at a depth of 150 ft. Johl & McDonald are also running a tunnel on their Ellen claim, and have cut a ledge of very high grade ore. They now have out about 40 tons of ore from these two claims and are hauling it to Luning, where it will be sampled and sold to the Castle Dome Smelting Co.

THE Honest John claim, which buts up against the Lottie, owned and being worked by Joseph and Brooks, McClane and others, has a shaft down 50 ft, which has cut several veins of rich ore, assays from which run up to $900.

MEAD, MURPHY & JOHL have commenced work on the Yerington & Bliss claim, located about 1 mile east of Johl & McDonald's claims. They have about 4 tons of rich carbonate ore on the dump. Assays run from $25 to $150 in silver, 75% lead and a trace of gold.

THE Woodhouse & Olson claim, about half a mile south of Garfield peak, has a shaft down 30 ft, the ledge at the bottom showing ore that runs from $500 to $1,000 per ton.

SILVER BELLE.—S. R. Avery has run several shallow cuts on the Silver Belle, showing up the surface of the ledge nicely. The Silver Belle is on the same belt as the Woodhouse & Olson. Lige Ellis and several others are at work in the vicinity of the Silver Belle.

FARRINGTON & MOSS.—This claim, located about 4 miles southwest of Johl & McDonald's properties, is at present the best looking prospect in Garfield district. The incline shaft is now down 75 ft, in ore all the way. There are between 30 and 40 tons of ore on the dump, that they claim will average $1,000 per ton. The owners estimate the amount in sight in the mine at the present time at $50 000.

HIGHLAND DISTRICT.

A TOWN.—Pioche *Record*, April 29: There is quite a little town at the Mendha mine, Highland district, now. There are three families living out there, the men working in the mine have their own castles to live in, and the prospectors all dwell in palaces of their own.

DAY COMPANY.—Three men have been placed to work getting out rock for the repairing of the furnace. Prospecting is still being pushed ahead in the Day and Mendha mines. There is no telling at what time the furnace will start up. We learn from Supt. McNally that there is no truth in the report that ore was being taken out of the mine for shipment to the furnance.

LEWIS DISTRICT.

BETTY O'NEAL.—*Herald*, May 3: There is not much change in the stopes of the Betty O'Neal, they still produce the usual amount of ore and there is plenty in sight. From present appearances the Betty will keep the Eagle mill running for many months. The company intend sinking their shaft to a greater depth and opening up levels below. A sinking pump has been ordered from below, and on its arrival 3 8-hour shifts will be put on and the shaft sunk as rapidly as possible.

MORNING STAR.—The contractors are making good headway in the Morgan incline on the Morning Star mine. Several men are kept sorting and sacking ore, which is being packed to the forks of the canyon. The present calculations are to have a large quantity of ore reduced at one of the mills in Lewis.

EAGLE.—The ledge in the Eagle tunnel has been stripped for about 200 ft; a crosscut has not been started yet to test the width or quality of the ore vein, though some rich pieces have been broken off.

SANTA FE DISTRICT.

COMING TO NOTICE.—Esmeralda *Herald*, May 6: Santa Fe is coming in for a very liberal share of the attention now being paid to that section of Esmeralda county, and, from what we saw, we may say, without hesitation, the district is deserving of all the notoriety bestowed upon it. The mines are situated all the way from 7 to 15 miles northeast from the town of Luning. There are about 50 men at work in the district. There is a large scope of country in Santa Fe that has as yet not been prospected. New locations are being made every day, and the district yields a variety of metals, such as gold, silver, copper, antimony, etc.

THE Tip Top mine, owned by B. G Smith & Bros., and under the management of Johnny Powell, is the best developed mine. There is a force of 12 men at work. Recently a very important development was made on the 250 level, an 8-ft vein of $100 ore being cut at that point. The work at present is merely prospecting and developing.

THE ILLINOIS.—Col. A. C. Ellis, the owner of this mine, has started men to work, and they are taking out some very fine ore. Near Mitchell springs J. Thomas Bradley has a force of 20 men at work on some recent discoveries. Mr. Bradley is satisfied that he has some of the best prospects in the district. At Earlington springs Rhodes & Wasson are working 10 men on prospects owned by them. The present showing is fair. The Fagan & Glasser mine has a few men at work taking out ore for shipment. There is in the neighborhood of 60 tons now on the dump. In the Dunbarton mountains, Santa Fe district, some copper discoveries of importance have been made.

WARD DISTRICT.

NO CHANGE.—White Pine *News*, May 5: Sam Chipman has returned from a trip to Ward. He says there is no particular change in the camp yet, but all look for lively times this fall.

RICH ORE.—The ore now coming out of the Monitor mine at Taylor district, says the *Reflex*, is much richer than for some time past. It now ranges between $300 and $100 to the ton.

ARIZONA.

GLOBE DISTRICT MINING NEWS.—*Silver Belt*, May 29: The Topia, formerly the Peacock mine, 2½ miles east of the Pioneer and ¾ of a mile north of the Capitan, belonging to Messrs. Gary and Hardesty, has, under recent developments proved itself a promising property. A drift running east from the main shaft has shown a fine body of ore 3 ft wide, samples of which are now in our office. The ore carries galena, zinc, gray copper, silver and a modicum of iron. The Foot mine, first east extension of the Topia, although not as extensively prospected as the Topia, wherever tested shows gray copper of good quality. The Mark mine, a western extension of the Topia, can scarcely be said to have been developed at all, but where openings have been made the showing gives confidence of a good ledge.

MESSRS. FORD, BOOTH & HATCH are vigorously at work on the Apache. They now have a shaft 80 ft deep, in the bottom of which a vein 5 ft wide shows. The vein is supposed to be a continuation of the South Pioneer, having the same porphyritic formation as the latter vein.

PIONEER.—Since the commencement of work on the Pioneer by the new owners, a tunnel of 150 ft has been run at a depth from the surface of about 125 ft, in which a large body of ore, very similar to that found in the Contention and Tough Nut at Tombstone, has been struck. The ore is free from base metals; the silver being chloride and sulphide.

DISCOVERY.—Walter McKean and Billy Woods have made a valuable discovery about 2½ miles northwest of the Pioneer camp. The vein at the surface is strong and shows an unusual width. At the depth of 15 ft a body of ore was revealed filling the entire bottom of the shaft, and is pronounced by good judges to be very similar to that found in the South Pioneer.

THE contractors on the South Pioneer are now making a connection from the 100 level (about 25 ft) to the old workings. The object of the connection is ventilation.

THE Howard Co. has nearly completed the grading for the hoisting works and necessary buildings. A force of men is now engaged in sinking a double-compartment working shaft. The Howard certainly is a valuable property.

ITEMS.—Bullion shipments from the Mack Morris for the week ending April 29th, $5,877.26; total to date, $500,312.40. The Hoosier Copper M. Co. squared accounts with laborers and other claimants to-day. Work on the mine is progressing satisfactorily; ore is abundant. The Old Globe and Hoosier copper companies are steadily accumulating ore on their respective dumps. The mines represented by these companies have the reputation of being valuable properties.

FURNACE COMPLETED.—Prescott *Courier*, May 3: Mr. Spear, just from Walker district, informs us that the smelting furnace was completed several days ago. All miners have confidence in Prof. Shafer, who is to run it. Mr. J. C. Boblett, of Lower Lynx creek, says that prospectors over there, who are operating for Albuquerque capitalists, have relocated many old claims and appear pleased with the mineral prospects of the locality. Messrs. Bowers & Richards, two of Prescott's shrewdest capitalists, have made arrangements with John and Frank Akers to sink 100 ft and drift 50 ft each way from the bottom of the shaft on the ledge recently discovered by the brothers on Lower Lynx creek, 7 miles east of Prescott. B. & R. do this work, or rather have it done, for one-half of the mine. The brothers were offered $8,000 for the ledge shortly after having discovered it. But Bowers & Richards' proposition suited them better. The ledge is looking well; rock rich in silver.

TOMBSTONE.—*Epitaph*, May 6: Nothing of unusual importance has transpired during the past week in local mining annals. The output of ore and bullion continue about the same, and the only matter of interest was the decision of Judge Stillwell in the suit brought by the Tombstone M. & M. Co. against the Way Up. Though the result of the decision was not unexpected, still it formed the staple subject of conversation for mining men, since the decision was promulgated.

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TOMBSTONE M. & M. CO.—Work continued on the 300-level of the Tough Nut and Good Enough, both drifts being in ground carrying bunches of rich ore. The Combination ore body is yielding about the same. The 100-ft Tough Nut and 250 ft Good Enough are the principal ore bodies. The West Side vein is yielding a fair quantity of high-grade ore.

GRAND CENTRAL.—The stopes are looking as well as ever. The bullion output for last month amounted to $154,650. Ore looking better than formerly and milling to better purpose. Mine down 600 ft; 125 miners employed.

CONTENTION.—The Flora Morrison shaft has been closed for the present. Will ship ore next week to Girard mill; sending the usual amount of ore to the company mill on the river.

THE GIRARD is partitioned into 4 levels at 150, 200, 270 and 329 ft. Work is being done on all levels, and each producing ore. The mine is looking well and yielding the usual quantity of ore. Ten stamps of the Girard mill will commence work on Contention ore to-day.

OLD GUARD.—The drift north from 80-level, 20 ft in first-class ore. Hoisting several tons of ore daily. About 175 tons now on the dump.

THE RANDOLPH.—This promises to be one of the great mines of the district at no distant day. Work of development is progressing rapidly, and large bodies of ore exposed to view. Working on the 100 level. Southwest drift in 105 ft. About 300 tons of ore on dump, running from $50 to $200. Quality of ore chloride, horn silver, carbonate and manganese. Mine looking fine and worked with avidity.

VIZINA.—The north drift of the 400-level is now in 60 ft; south drift, same level, 68 ft. The crosscut going west on the 100-level is now extended 110 ft. The stopes are looking as well as usual. There were only 120 tons of ore shipped from this mine in April, owing to the mill being running on Ingersoll ore.

BISBEE ITEMS.—Tombstone *Epitaph*, May 5: Col. Cordon, an old-time prospector, made his appearance in Tombstone yesterday, after several months' absence. The Colonel is operating in Warreu district, and is the happy owner in part of the Charter Oak mine. We were informed by him that the people in and around Bisbee were in a high state of excitement over the Indian question. The copper mines in the vicinity of Bisbee are coming out strong. The Ounsight, Charter Oak and others, in Warren district, are turning out rich copper, silver glance and gray copper.

COLORADO.

EMPIRE ITEMS.—Georgetown *Courier*, May 4: The new Carter process mill, at North Empire, is giving excellent satisfaction, with the exception of the amalgamating tube. The ore is roasted in a very thorough manner, and no doubts are now entertained in regard to the ultimate success of the mill. The ore treated is from the Silver Mountain mine, owned by the Great Republic Co. Mr. B. O. Russell has leased the Pioneer mine and mill and is working a force of 9 men. The lower drift on the Empire City lode is being driven ahead steadily with a double shift. The breast is in 278 ft, and shows from 6 inches to 1 ft of ore that carries from 2½ to 5 ounces gold per ton. The Upper Union tunnel, owned by Dr. Godfry and others, is being pushed ahead by 4 men. A lode was recently intersected in this tunnel that carries a vein of good-looking copper ore. The Murphy is being worked by 3 men. It shows a good vein of ore, that at the last mill-run returned 12½ ounces gold per ton. The Great Republic Co. has a couple of men driving the lower adit of the Great Republic lode. There is a large amount of ore piled up at this mine, ready for treatment. The water is being taken from the North mine, preparatory to the resumption of work. There is a large amount of concentrating ore piled up at this mine. The town of Empire is showing much more life than it has for years. Town lots are being taken up very fast, and lot-jumping—an unfailing sign of prosperity—has been indulged in to a small extent. Many strangers have arrived lately for the purpose of mining in that neighborhood, and, as a whole, the district is showing unmistakable signs of returning prosperity.

IDAHO.

SMELTERS FOR THE UPPER COUNTRY.—Wood River *Miner*. Col. E. Greene, of the Philadelphia Co., who was on Wood river during the early part of the week, informed a *Miner* reporter that a second smelter, of 40 tons capacity, is en route for the Warm Spring creek mines, and that others will be ordered if there is a demand for them. Within a few weeks two 40-ton smelters will be turning out bullion on Warm Spring creek. Over 1,000 tons of ore are now out and ready for reduction. The ore was taken from the Philadelphia Co.'s properties.

A PROPOSED RAILROAD.—Several gentlemen, possessing large capital, came to Hailey yesterday with a view of building a railroad between this point and Bellevue. Their plan is to lay a track of timber, faced with quarter-inch iron, flat rails, and to put on a passenger car with a capacity for 30 persons; also a flat car for the transportation of freight between the two towns; the cars to be drawn by a dummy engine. The cost of construction and equipment is estimated at from $6,000 to $7,000. The projectors propose to put up all the coin and to own and control the road. The home station and headquarters of the company will be Hailey.

THE NIGHT HAWK SOLD.—The Night Hawk mine, adjoining Col. Greene's famous Black Hawk, on Warm Spring creek, above Ketchum, was sold Monday to Angus McMasters and Sam Lichtenstadter. The owners of the Night Hawk were John Connor and Charles McCloud. About 25 tons of good ore is on the dump, and the 65 ft shaft shows up well in rich mineral. The new owners will put a full force of men at work as soon as the roads are sufficiently good to admit of taking up machinery, and the development will proceed as rapidly as admissible.

MONTANA.

HAWKEYE.—*Inter-Mountain*, May 4: The Hawkeye is a claim lying between the Alice and Belle of Butte mines, and is penetrated for a length of 900 ft by the Belle of Butte ledge. It is owned by the Alice company, and near the east end line a shaft has been sunk to a depth of 155 ft, the intention being to connect with the west drift of the Belle of Butte.

BELL.—The stopes in the 200 and 300 levels of the Bell never before were so productive as now, and it seems that were the capacity of the smelter twice what it is, the furnaces could be very easily supplied. The mine is now in good working shape. The output of the property is now 50 tons per day, which is being shipped to the smelter. The ore is of a somewhat improved quality.

MORNING STAR.—Over 100 tons of ore, which will average between 75 and 90 ounces per ton, are now on the dump of the Morning Star. Within the next week it will be shipped to the Colorado smelter for reduction. The daily production of ore is about 6 tons.

MOUNTAIN CON.—During the past two weeks the powerful hoisting machinery has been got in readiness to run, and the water has all been pumped out of the shaft.

NEW MEXICO.

SANTA RITA COPPER AND IRON CO.—*New Southwest*, April 26: This company expects to commence smelting again next week at the new site to which their smelter has been removed. This removal occasioned an unfortunate delay, which could not well be avoided, the old site being too near the mill for safety. In the meantime the company's mill is actively engaged in accumulating concentrations for smelting.

NOTES.—A lump of ore from Bremen's "76" mine, weighing 2 or 3 tons, was sent east last week. Its value is estimated at about $4,000. Shedd has received a 4-months extension on the Black Hawk and other properties in the Bullard Peak. The Blue Bell bond has not expired. The Income Co. has about 2,000 tons of good ore on the dumps of the various mines they own. They will begin to ship the bullion from their mill regularly after next week. The mill of the Silver City M. & M. Co., heretofore known as the Carrollton mill, was started up Wednesday last, on ore from Lone mountain, belonging to Frank Bisby. Mr. Henderson, the superintendent, expects to keep the stamps steadily at work on this and the Cosette mine ore. The main shaft on the Shermau is down to the 100-ft station. A drift will be at once started to intersect the vein. This level will be connected with the bodies known to exist above. The increased force of men has been put to work extracting ore for the mill. Some very high-grade ore has been found during the past week. The hoisting engine is now in good running order, and works very satisfactorily. Carpenters are at work framing the shaft house. Our Eureka correspondent writes us as follows: The M. & N. M. C. M. Co. are still finding large bodies of high-grade ore in the Hornet and King mines, and continue their weekly shipments. Of 40 tons shipped by them they received an average of $175 per ton net.

OREGON.

PROLONGED SEASON.—Jacksonville *Times*, May 5: The mining season has been prolonged considerably by the late spring rains, and proves to be a favorable one generally. Miners owning gulch claims have hardly been as fortunate as others, however.....Bybee, Newman & Hawkett, who own one of the best pieces of mining property in the State, situated near Waldo, will soon commence getting it in shape for next winter's run. They will repair the old ditch, and perhaps build a new one. .....McMullen & Johnson, of Silver creek, Josephine county, are doing very well. They have been picking up some good-sized pieces, one of which weighed $23. There is an unusual quantity of snow in that section, which retards expeditious mining.....A great many miners are now engaged in cleaning up. Osterhout & Co., of Foots creek, made a clean-up the other day, which resulted favorably.....John Atteberry says the miners of Jackass have moved more dirt than ever this season, with favorable results.....Saltmarsh & Co., on Sterling creek, continue to pick up chunks of gold in their claim. Last week they found a neat nugget, worth $80. A good clean-up is expected here.....O. Swacker informs us that the miners of Foots creek have plenty of water still, and are doing well. Lance & Co.'s hydraulic claim is being worked to perfection, and a good clean-up is expected.

THE proprietors of the iron works at Greenville, Plumas county, have constructed a steam launch, to be run on Feather river, at Big Meadows, for pleasure excursions.

Chemistry of Ripening Wheat.

Scientific Teets with Practical Bearings.

The discussion of hest methods of harvesting wheat involvee many considerations. Direct issue is now heing made between the result hy self-hinding reapere and hy the old header method of gathering. Very important are the cost of the work, the saving and waste of grain, etc. Another matter of importance is the composition of the grain at different times of cutting. Thie is a matter which only the chemist can accurately eet forth, and to assist those who are fully able to figure up the labor and gross weight items from their own experience, to arrive also at the chemical etatns of the queation, we reprodnce, below, the detailed chemical investigatione made last summer hy Prof. Kedzie of the Michigan Agricultural college, and read last August hefore the American Society for the Advancement of Science:

Prof. Kedzie's Report.

The wheat crop of the United States ie of great importance, hecause it is a etaple agricnltural production in nearly every State and Territory of our Union. The grain is also important, hecause it furnishes the leading article of food for civilized man. Both as cousnmers and prodncers Americane are interested in this leading cereal. Any circumstance, therefore, which may affect its production or modify ite nature as food hecomes a matter of general intereet.

One of the circumstancee which has a modifying influence upon the quantity and the qnality of wheat is the time of cntting the grain. There is eome divereity of opinion respecting the time when wheat shonld he cut in order to eecure the hest resnlts, eome advocating early cutting, and others recommending that the grain ehould become dead-ripe hefore harvesting. The plea for complete ripening, like the plea for flinty wheats as a class, is hased upon the claim that only the hard and flinty wheats have the desirable amount of glnten; that the early ripened and the eoft wheats are so deficient in gluten that good flour cannot he made from them, and only the hard wheats possess the requisite amount nf gluten.

The trne explanation of this exaltation of the flinty wheats, and depreciation of the soft wheats, is that there has heen a revolution in the methods of milling, hy the introduction of the patent process. Under the old method of milling, when the grinding was completed at one operation, the soft wheate were in demand, and early cntting, while "the herry was in the dough," was recommended. But since the new process has heen introduced, in which the grinding is accomplished in successive etages, and the highest prized and priced flour ie now made from the middlings, which formerly were discarded as unfit for human food, a very different quality of wheat is desired. The eoft wheate are no longer in demand, hut the hard and flinty wheats, which will produce the largest amount possihle of middlings for purifying, making the "new process flour." The farmer is urged to discard his white winter wheat, and to let his wheat stand till dead-ripe, in order to secure the hard aud flinty herry. This is fair and legitimate, and ehould give offense to no one, for the miller has the right to give the preference to one quality of wheat herry over another quality; hut ths case hecomes different when he alleges, ae the ground for enoh preference that the soft wheat is eo deficient in gluten as to he incapahle of making good flour, and that the formation of gluten is one of the latest acts in ripening of wheat, and that the early ripened herry is so defioient in gluten as to he unfit for milling. The question, then, hecomee one, not of physical tsxture, hut of nutritive value. The farmer resents the impntation that his grain is deficient in the most important nutritive principle, while the conaumer hecomes solicitons lest he may he using flonr not up to the standard in nutritive value.

There would have heen less heat in this disonssion if the miller had frankly said that in consequnce of a great change in the process of milling, wheat of a very different textnre is now in demand, without attempting to drive out the wheats which have heen standarde of excellence, hy representing them ae so deficient in gluten as to he unfit for his nse. The farmer replies: "My white winter wheat had enough gluten five years ago, and commanded the highest price. Why has it hecome so poor in gluten?" It ie hardly fair for the miller to attempt to cover his change of hase from white to flinty wheats hy this flank movement of asserting that soft wheats are deficient in gluten.

But if it is true that the hard and flinty wheats alone contain the desirahle quantity of gluten, and that glnten ie the last principle developed in the process of ripening, it is important for all clasees that the facts should he known, hecause in the long run the truth can wrong no one.

We are told that the wheat of warm climates is richer in glnten and more flinty in texture than wheat of cold climates. Some persons seem to aseume that the flinty quality of such wheat ie in consequence of ite large content of gluten, and that the hardneee of any wheat ie proportioned to ite content of gluten; that eince the wheat of thie climate hecomee more flinty hy over-ripening, thie change mnst he attended hy an inoreaee of gluten in the last etagee of ripening.

The oomposition of wheat at different psriods of growth, sesmed to me a snhject of so much importance that I determined to give it a carefnl investigation. In such a etudy it was not my desire to view the snhject from the standpoint of either the farmer or the miller. My aim was to establish data rather than to formulate opinions. It eeemed to me that for ench an investigation the most trnstworthy conditions would he farnished hy chemical analysis of the wheat at different etages of growth.

Selecting Specimens.

A field of Clawson wheat, which appeared to be very nniform in its growth and in the quality of its soil, was selected for one eet of specimens, and another similar field of Schumacher wheat for a parallel set of epecimens. I decided to take two sets of specimene of diffsrent varieties of wheat in order to eliminate the inflnence of individnal peculiarities in either variety.

I hegan to gather my specimens on June 26th, and gathered a specimen of each variety at 9 o'clock A. M. for 21 euccessive days, a period embracing the progressive changes of the herry from its early formation, and hefore the contents of the herry were milky in color, up to the time nf dead-ripeness. The Schumacher, however, was fonnd to he somewhat in advance of the Clawson through the whole eeries, and the herry was in the milk at the first cntting. It seemed to keep about five days in advance of the Clawson.

A emall hundle of the grain was cut, lahelled, and placed to ripen and dry iu an airy room, so as to give the hest possihle conditions in harvesting; and every hundle was snhjected to the same treatment in drying and ripening. When fully dry, the grain was heaten out hy hand, winnowed, and preserved in glase jars for chemical analyeis. The grain, thus ripened on the etalk, as it slnwly dried in the sheltered room, was different from what it wonld have heen if threshed out as soon as cut; hut the difference was the same for all, and the grain thns matured wonld represent the results secured hy ripening under the most favorahle conditions of harvesting at the several periods of cutting.

Condition at Time of Cutting.

The following diary will give some idea of the condition and development of the herry and the ripening of the stalk at the snccessive periods of cntting. I aleo inclnde a hrief etatement of the condition of the weather, which may assist in explaining the rapid changes which took place at certain stagss of growth:

Description of the Different Cuttings.

No. of Cutting.	Mean Daily Temperature.	Clawson Wheat.	Schumacher Wheat.
1	77½°. Cloudy.	Stalk green, berry watery and immature, a little milky.	Stalks green; herry milky, easily crushed by fingers, sweet.
2	75° Rain.	Stalk green; leaves rusted slightly; berry very immature, somewhat milky.	Stalk green; berry easily crushed by fingers, milky and sweet.
3	62½°. Rainy.	Berry milky and sweetish, color of berry, green.	Berry more milky, but greenish; can be crushed hy fingers; sweet.
4	68° Cloudy.	Berry milky and sweet; still green in color.	Berry, yellowish, milky dough; fingers stained hy milk when being crushed.
5	70½° Clear.	Berry milky, sweet, green, no dough.	Straw becoming yellow; berry in milky-dough condition.
6	72½° Clear.	Straw still green; herry milky, sweet, greenish in color, no dough.	Berry in the dough; crushed between thumb-nails, stains them.
7	77½° Cloudy and raining	Stalk green, hut leaves yellow; berry more milky, sweet, yellow-green.	Straw purplish, hut leaves green; berry in the dough and becoming yellow.
8	79°. Hot and close. cloudy.	Straw green; heads yellowish; herry yellow green tbick milk, sweet.	Head brown; herry deep yellow, stiff dough, can be crushed hy thumb-nails.
9	66°. Cooler and cloudy.	Stalks and heads turing yellow; herry milky-dough, sweet.	Berry brown, hard; difficult to crush between thumb-nails.
10	71°. Clear.	Stalks and heads yellowish green; oerry less sweet and more doughy.	Berry crushes dry; grain harvested today.
11	78° Rain in night.	Stalks yellowish; heads begin to bend; herry, thin dough, a little sweet.	Straw purplish-red and fully ripe.
12	73°. Rainy.	Straw yellow; heads hend more; berry, in the dough, only a little sweet.	Heads bend over; stalks hecoming brown and leaves dry.
13	75°. Cloudy.	Heads bent over; berry, stiff dough.	
14	74°. Clear.	Berry crushes dry between thumb-nails; harvested today.	
15	76°. Rain in night.	Berry nearly dry and becoming hard; straw entirely ripe.	
16	75°. Cloudy.	Berry dry and hard; stalks a full yellow.	Ripe and over-ripe
17	73½°. Clear.	Stalks over-ripe; berry shells on handling sheaf.	
18	79°. Clear.	Stalks become brittle.	
19	81°. Clear.	Stalks become brown and brittle.	
20	85½° Cloudy.	Manifest'y dead ripe.	
21	78°. Cloudy.	"Still dead."	

The Gross Product Per Acre at Each Cutting.

The amount of grain, ae influenced hy the psriod of cutting, is a qneetion of practical importance to the farmer. In making this estimate, I confined my attention to the weight of perfeotly dry herry, hecause I was satiefied that any variation in amount of grain attendant upon changes dnring growth arise from variation in the size and weight of the herry, and not from any change in the numhsr of grains growing on a given area, since new grains wnuld not form dnring the period of ripening, and all those already formed woud pass throngh the successive stagee of development more or less completely. In this way there were eliminated several sources of error incidental to meaeuring the grain produced on a given area, ench as the loss of grain in handling, and from incomplete threshing, varying productivenese of different plots of soil, eto. All hroken kernels and foreign substances of every kind were removed, hut no grains were removed in consequence of imperfect development. The grain was then poured into the scale-pan of a delicate halance, and ten grammee carefolly weighed out, and the numher of grains of wheat counted. This wae repeated ten times for each specimen, and one-tenth of the sum of the whole was taken as representing the numher of kernele of wheat for the weight of ten grammes.

The gross product of grain at the several stages of growth would he directly ae the weight of the kernels, and inversely as the numher kernels required to produce a given weight.

The average numher of grains of wheat required to weigh 10 grammes at the several periods of cutting is given in the following tahle. I have also estimated the number of hnshels of grain at the different periods of cntting on the supposition that each variety of wheat produced 30 hnshels to the acre as its maximnm. The tahle also contains the percentage of nitrogen, cellulose and ash, at the different periods of growth:

TABLE I.

Number of Cutting.	Clawson. No. grains for 10 grains.	Clawson. Bushels to acre.	Schumacher. No. grains for 10 grams.	Schumacher. Bushels to acre.	Clawson. Nitrogen.	Clawson. Cellulose.	Clawson. Ash.	Schumacher. Nitrogen.	Schumacher. Cellulose.	Schumacher. Ash.
1	764	11.23	484	16.11	3.62	4.03	2.72	3.72	3.40	2.20
2	592	13.34	447	17.44	2.36	4.05	2.48	2.73	3.42	2.21
3	531	14.91	455	17.13	2.31	3.55	2.30	2.75	3.31	2.19
4	471	16.81	383	20.37	2.03	3.47	2.24	2.53	2.90	2.18
5	454	17.44	365	23.00	2.04	3.29	2.04	2.51	2.86	2.05
6	362	21.87	332	24.49	1.98	3.16	1.97	2.42	2.88	2.00
7	384	20.62	320	24.37	1.94	3.18	1.96	2.38	2.85	1.97
8	337	24.27	308	25.32	1.96	3.08	1.90	2.48	2.80	1.98
9	316	25.03	304	25.66	1.90	2.80	1.80	2.37	2.83	1.96
10	290	27.31	260	30.00	1.89	2.80	1.81	2.29	2.76	1.94
11	276	28.69	267	29.21	1.96	2.79	1.91	2.41	2.74	1.92
12	282	28.08	260	30.00	2.00	2.40	1.94	2.36	2.68	1.96
13	267	29.66	261	29.88	1.98	2.23	1.91	2.39	2.45	1.91
14	272	29.12	262	29.77	1.99	2.29	1.89	2.39	2.31	1.93
15	264	30.00	266	29.36	1.92	2.26	1.87	2.37	2.26	1.90
16	272	29 12	263	29.65	1.87	2.15	1.82	2.39	2.21	1.86
17	270	29.27	260	30.00	1.97	2 26	1.86	2 36	2.24	1.87
18	277	28.69	260	30.00	1.94	2.35	1.88	2.27	2.29	1.86
19	268	29.55	262	29.36	1.94	2.40	1.77	2.26	2.33	1.85
20	272	23.12	272	28.67	1.84	2.38	1.79	2.29	2.37	1.84
21	268	29.55	276	28.26	1.92	2.39	1.78	2.21	2.36	1.8

The falling off in the seventh cutting of Claweon ie curious, and I can offer no explanation. After the complete ripening of the grain there is a sensihle decrease, showing that the common impression among farmers that there is diminished production of grain when harvesting is delayed too long, is well founded. This loes ie not from careless handling of the grain or from drying hy over-ripening The loss is a real one, thongh not large.

Chemical Analysis.

The wheat wae powdered hy prolonged hsating in an iron mortar, and sifting this in a wire sieve of 38 meshes to the inch, and this process repeated till the entire quantity taken had passed throngh the sieve. The amount of water in each specimen was determined hy prolonged heating in the steam hath, and cooling in a sulphuric acid desiccator till there was no further loss of weights, and the entire loss of weight was taken as water. The results of all analyses and other estimations are hased upon water-free material.

The ash was determined hy prolonged hurning in a shallow platinum dish, kept at a low red heat till the ash hurned white, and the ash was weighed with its natural contents of carhonic acid. The percentage of ash ie given in tahle I, which shows a regular decline as the grain develops hy formation of ash-free carhhydrates.

The cellulose was estimated hy hoiling in water containing 1¼% sulphuric acid, then with water, and repeating process; then with 1¼% canstic potash solution—then hoiling with water and washing the crude cellulose with alcohol and ether, following Henneberg's method. The crude cellulose was then dried in water hath to constant wsight; then incinerated and the weight of ash deducted, when the residual weight was taken as cellulose. No estimate was made of the small amount of nitrogen which it contained. The cellulose was of a light-hrown color.

The percentage of cellulose regularly decreased from the earliest formation of the grain np to the time of ripening, the amount heing greater in the first cuttings of Clawson than in those of Schumacher, hecause of its more immatnre condition. After ripening, there is an increase of cellulose, showing that over-ripsning is attended hy a loss of nutritive material, if we consider dense cellulose as indigestihle. Thie increase of cellulose seems to he in intimate relation to the process of hardening exhihited in dead-ripening.

The nitrogen was determined in the nenal way hy comhuetion with eoda-lime, and the amount of alhnminoids estimated hy multiplying the nitrogen hy 6.4. The percentage of nitrogen ie given in tahle I, and the estimated amount of alhnminoide in the dry euhstance ie given in tahle II.

TABLE II.

Dry.	Per cent. gluten. N×6.4= gluten. Clawson.	Per cent. gluten. N×6.4= gluten. Schumacher.	Water. Clawson.	Water. Schumacher.	Acreage products—Lbs. Albuminoids. Clawson.	Acreage products—Lbs. Albuminoids. Schumacher.	Acreage products—Lbs. Carhhydrates. Clawson.	Acreage products—Lbs. Carhhydrates. Schumacher.
1	16.77	17.40	9.84	12.81	113 00	168.19	516.32	544 28
2	15.10	17.41	10.98	11.97	120.88	182.18	627.27	805.31
3	15.16	17.60	11.13	2.78	139.62	180.88	707.65	790.41
4	13.37	16.19	11.32	12.69	134.85	197.87	805.66	962.24
5	13.05	16.06	11.83	15.44	136.56	221.63	854 07	1,091.61
6	12.67	15.49	11.26	13.74	166 2	248.63	1,078.64	1,122.00
7	12.4	15.23	10.85	12.0	153.54	221.78	1,020.37	1,169.95
8	12.54	15.63	10.46	11.80	140.34	238.2	1,201.10	1,203 37
9	12.16	15.42	10.83	14.93	182.62	237.40	1,239.20	1,230.46
10	12.09	14.55	11.66	11.64	198.11	262.9	1,364.95	1,452.50
11	12.54	15.17	12.41	12.04	215.86	255.8	1,434 63	1,312.79
12	12.80	15.10	13.53	11.54	215.65	272.7	1,396.03	1,443.33
13	12.67	5.2	13.5	11.52	225.47	274.02	1,480.16	1,340.62
14	12.28	15.29	12.62	11.77	214 56	273.12	1,461.18	1,435.30
15	12.28	15.17	14.51	12.62	221.04	265.7	1,504.68	1,412.60
16	11.90	15.29	13.53	12.14	209.31	272.08	1,469 10	1,434.60
17	12 80	15.10	15.54	12.44	224.79	272.86	1,49.01	1,453 22
18	12.41	14.57	13.71	11.99	213.62	263.72	1,434.78	1,461.58
19	12.41	14.40	12.58	12.17	220.00	260.1	1,479.07	1,464.61
20	12.41	14.20	12.85	12.08	216.83	244.27	1,458.51	1,393.51
21	12.28	14.14	12.40	12.88	217.72	239.76	1,471.35	1,376.30

By tahle II. it will he seen that the highest psrcentage of alhuminoids is formed in the earliest stages of growth, and it falls off regularly to the complete ripening of the seed, which contains relatively less alhuminoids than at any previous period of growth. The claim that gluten is principally formed near the close of the process of ripening, and that the dead ripe wheat containe more glnten than wheat harveated at some earlier period of growth, receives no support frnm the results of these analyses.

The hard and flinty herry secured hy over-ripening is no richer in gluten than the softer herry secured hy early harvesting. I am now speaking of the percentage composition, and claim that a hundred pounds of early ripened wheat will contain a greater number of pounde of alhuminoids than will a hundred pounds of the same wheat at a later period of ripening, when the accumulation of starch and other carhhydrates will have lowered the relative amonnt of alhuminoids. But while the alhuminoids are centessimally greater at early periods of growth, the acreage produot increases with the growth of the crop up to a certain stage of ripening (when the grain crushee dry), and after thie period there is un increase either relatively or absolutely. This will he seen hy a glance at the tahle, which gives the acreage product of alhuminoids on each succesive day of cutting. If the dead-ripe wheat is hetter for the miller than wheat cut an earlier period, it is in consequence of the physical properties of the flinty herry, and not from any change in the chemical composition or increase of nutritive value.

Carhhydrates.

One significant change in the procses of ripening wae the rapid accumulation of starch. So rapid was the accumulation of the carhhydrates, that while the alhuminoids inoreased in actual amount the increase of carhhydratee was eo much more rapid that the percentage of alhuminoide fell off continually up to the period of ripening, and when the storing up of starch was completed the ripening of the grain was also complete.

Straw.

No effort was made to detsrmine the foodvalue of the etraw at the different periods of cutting. The grain eo far outranks the straw in money value, that the farmer is willing to sacrifice the straw, if therehy he may secure a corresponding increase of value in hie grain; hut the farmer is well aware of the rapid deterioration of the straw hy allowing it to stand till the grain is dead-ripe, and if the dead-ripening is attended hy no rsal increase of valne in the grain, hut an actnal loss in the amount of grain, and the etraw deteriorates greatly in the meanwhile, he may conclude that it is hest to cut hie grain ae soon as ripe, and thus save himself from needless loss.

A LARGE MINING SUIT.—A suit has heen commenced hy Morris Cohen, of San Francisco, in the Superior Court of Calaveras county, against the administrators of the estate of A. M. Mitchell, decsased, and Wm. Cline, to recover a large interest in certain mining property in Vallecito mining district, Calaverae county, which is said to have a speculative value. Some of the mining lawyers who fought the Alhion-Richmond litigation in Nevada have heen retained hy the plaintiff, whose complaint is in the nature of a hill in equity to oompel the defendants to deed him the premises in dispute, and, judging from the voluminous pleadinge and the reputation of counsel in the case, there may he expected a prolonged and expensive litigation. An injunction has already heen iseued which arrests all further proceedings in the estate. Inasmuch as the administrators had negotiated a sale of the property, this ties their hands and calls them to account for the *alleged* intereet of the plaintiff in the property hefore any further steps are taken by them to dispose of it to a third party.

A PLOWING PROSPECTOR.—This occurred in Amador county, in this State: Not long since, while plowing a vineyard helonging to Mre. Jonn Bales, near the old Hardenhurg mine, the plowman struck a small seam of rich-looking qnartz. Mr. A. Kessler has followed this seam down about two ft. and the rock is richly laden with the precious metal, showing free gold in liheral quantitiee.

FROM Mr. H. L. Nickels we learn that a hack channel hae heen struck by Superintendent Yule in the Lewiston company's mine on Park's har, and what is hetter, that the new channel prospecte well and promiees to he exteneive.—*Trinity Journal.*

Steady Progress in Tombstone Mines.

No mineral district within the United States has made so wonderful progress in development within the last four years as the Territory of Arizona. It only seems like a day when we look back to the discovery of the mines of Tombstone, which have proven the chief factor in working the great revolution in this then land of the Apache. It is true that before this most notable discovery there had been mines which had yielded large amounts of bullion, and that had paid their owners handsomely for a short season. Notable among these were the old Vulture, near Wickenburg, the Peck, near Prescott, and some of the Castle Dome mines, on the Colorado. Exhaustion had closed the Vulture, litigation the Peck, and other causes had lessened the product of the less noted mines of the early days of Arizona, until the whole country was looked upon by mining operators as being quite or nearly as destitute of valuable mineral deposits as it was desert and barren in its general aspect. The discovery of the bonanzas of the Tombstone company and that of the Contention created scarce a ripple in the Pacific coast mining circles, so prejudiced were the operators of San Francisco against anything east of the Colorado river, and in fact the tone of public sentiment there is but little better today than it was four years ago, notwithstanding the millions that have been poured into her lap from this adjoining country. The bullion product for the calendar year ending December 31st, 1880, is estimated by the Director of the Mint at $5,566,601. That for the year 1881 was nearly $13,000,000, or a gain of fully $7,000,000. This shows the enormous strides made in the short space of one year, which we expect to see equaled, if not exceeded, this year, which will make Arizona's output not less than $20,000,000, placing her second only to Colorado.—*Epitaph.*

The Rich Old Placer Diggings of Mono.

J. C. McTarnahan has for the past year been making preparations for hydraulicing at Dogtown gulch, in the old Mono diggings, where the ground in 1861-2 was very rich in places. He left Reno on the 22d, en route to Bridgeport, to commence operations, which will be continued until the ice and snow of next winter compel him to abandon the work. He has a long flume already constructed, and an unlimited supply of water from Green creek is ready to be turned on. Twenty men will be employed night and day upon a bank 12 to 20 ft. high. The ground is known to be good, and there are thousands of acres equally valuable in that vicinity.

Mr. McTarnahan told a Reno *Gazette* reporter that there would be no trouble about slickens, as the land below the tailrace is of an alkali nature, and will be greatly benefited by the sand and sediment which may be deposited on it. In fact, Mr. McTarnahan has been offered a respectable sum if he will divert his tailings upon a certain farm in the vicinity. The few small spots over which the slickens must necessarily flow, unless impounded, and which will not be benefited by them, have been bargained for at a fair price per acre, if damaged; so that everything between the miner and farmer has been amicably arranged prior to commencing operations. The gold obtained at Dogtown is very fine, worth $18 per ounce, while over the ridge, a mile distant, in Old Mono proper, it is worth not more than $13. Several citizens of Reno are interested in this venture. It is to be hoped that it will be a profitable one.

Mills in Douglas County.—The Ventura mine, at which a five-stamp mill is being set up, is in Burbank District, three or four miles east of the Mountain House, on the Aurora road. The property is owned by M. B. Dwelly, of Gold Hill, and M. C. Lake, H. H. Beck and others, of Reno. They have, says the Genoa *Courier*, about 200 tons of ore on the dump, which they estimate will work from $30 to $45 per ton. There are twenty men now at work, and as soon as the mill starts more men will be put on. The Orpheus mill, which is situated nearer the Mountain House, started up last Monday. The owners of the mine have heretofore paid expenses with a hand mortar, and good results seem almost certain. The Alda mill, which is situated some six miles further north, will start up in about a month, or sooner if the road can be cleared of snow, on ore from the Alda and Alpha mines. The Alpha company are also taking out ore that they estimate will mill over $50 per ton. It is said to be the richest ore ever found in the mine, and comes from a point 200 ft. from that portion of the mine heretofore worked. Two other mills will shortly be put up in that section.

What Our Coins Weigh.—One million dollars in gold weighs 3,685 5 7 lbs. avoirdupois; 1,000,000 trade dollars weigh 60,000; 1,000,000 of 412½ grains weigh 58,928 4-7; 1,000,000 in fractional coin weighs 55,114 2-7; 1,000,000 in five-cent nickels weighs 220,457 1-7; 1,000,000 in three-cent nickels weighs 142 857; 1,000,000 in one-cent pieces weighs 685,714 1-7. A coinage of 4,000,000 of the new silver dollars per month would amount in a year to 2,838,572 3 7 lbs., or over 1,414¼ tons, and if the pieces were laid side by side they would form a continuous string 1,136½ miles in length.

Useful Information.

The Dangers of Ignorance.

One cannot judge from the brief accounts given what are the precise causes of many disasters, but there is reason to believe that ignorance is prolific; that many persons have only a vague knowledge of the qualities of nitro-glycerine, cannot recognize it when they see it, and are not acquainted with the various forms in which it is compounded, or with the peculiar dangers of handling it carelessly. Nitro-glycerine itself is a dense, yellowish liquid, but in order to diminish the danger attending its use, fine earth, ground mica, sawdust, or some similar powder, is saturated with it, and thus the various blasting powders known as dynamite, mica powder, dualin, rend-rock, etc., are formed. These compounds can be transported with comparative safety. But the nitro-glycerine easily drains off from the powder and oozes from any crevice in the vessel in which the compound is kept. Drops of it thus bedewing the edges of a box may very easily be mistaken for oil escaping, and if workmen ignorantly endeavor to nail the box tighter or to open it for examination, there will be a disastrous explosion. Several have occurred in past years in this way. The victims knew, no doubt, that nitro-glycerine (or the compounds) may be exploded by a blow (contact with fire is not needful), but they did not suspect that the innocent-looking oil was nitro-glycerine.

Why should not youth be taught in the schools somewhat of the practical dangers of these substances which are coming into such common use? They would pursue the study with interest, especially if there were judicious experiments. A Missouri story is that a teacher confiscated a small metal box which a pupil was playing with in school hours, and, thinking it contained chewing gum, tried to break it open with a hammer. It was a dynamite torpedo of the kind used on the railroad track as a danger signal, and large bits of it had to be cut out of the lady's cheek. Would it not have been well if she had known somewhat of the aspect of torpedoes? Was it not more important to the journeyman plumber who threw the lighted match into the pan of camphene, mistaking it for water, by which the great printing establishment of Franklin Square was burned some 28 years ago, to know camphene by sight than to have memorized many of the matters prominent in a public-school course? Surely workmen, especially "raw hands," in establishments where these things are used, should be systematically instructed in advance, and the courts are now enforcing this principle.—*Benjamin V. Abbott, in Popular Science Monthly.*

Sweet Gum Timber.—The diminishing supply of black walnut for cabinet work and car-building purposes, makes it highly desirable that its place should be made good by other kinds of hard wood not hitherto used. Many inquiries are made as to the capabilities of sweet gum for this purpose—a kind of timber which is quite abundant in some of the Southern States. It is strong, close-grained, has a handsome color, is easily worked and holds a nail well, but has an inveterate tendency to spring and warp, so much so, in fact, that if used for coffins, it would, to borrow the expression of a dealer, "twist itself right out of the ground, corpse and all." It is said to give good satisfaction, however, where it has been worked narrow and well fastened. Any one who can discover a method of preparatory treatment that will overcome this difficulty, has a fortune within his grasp. There is an immense waiting market for the timber, in case it can be made available for the same general uses as black walnut. A writer in the *Northwestern Lumberman*, who has been in the lumber business for many years, says he has used it both for framing and finishing and finds that it does well in a twelve year's test, although it is only the old, well-matured trees that turn out good finishing lumber. These trees can be distinguished by their scaly bark. The older the tree the less is the liability to warp, and the better the color; but lumber cut from young smooth-barked trees will warp and spring badly.

Metalline.—The compacted material known as metalline is destined, it is believed, to effect a great revolution in both heavy and light bearings. Its moderate strength requires that for heavy work it should be supported by metal; it was introduced in the form of plugs thickly distributed in the bearing surfaces. The U. S. Government has recently ordered this material to be applied in five thousand bearings. It called for two millions of the plugs. An improvement was in progress which would allow oil to be used with it.

Successful Electric Lights.—Cleveland is now illuminated by electric lights on two tall masts, one of them 250 ft. and the other 200 ft. high, and it is demonstrated that at half a mile distant ordinary newspaper print can be clearly read. It is also said, says an exchange, that the higher the electric light the more distinct, the more penetrating and the more valuable will be its effects.

Iron or steel immersed in a solution of carbonate of potash or soda for a few minutes will not rust for years; not even when exposed to a damp atmosphere.

Fats and Fatty Acids.—To recover grease and fats from water or suds in which wool has been washed several processes may be employed. One of the best is to treat the water with sulphuric or muriatic acid, by which the grease or fat is decomposed, and the fatty acids separated. This should then be removed to a separate vessel, preferably a lead-lined wooden one, heated to 212° with live steam. A small quantity of chalk should be added to neutralize the free sulphuric or muriatic acid present, and the mass thoroughly stirred with the addition of hot water. It should then be left standing for some time to settle, and the fat can then be drawn off clear. It can be reconverted into soap by alkali, or may be further refined by the methods in common use and used for the preparation of candles. The following plan, according to Simmons, for recovering oils and other useful matters from soapsuds and other waste waters, in use in England, is to treat them with the exact amount of a mineral acid requisite to liberate the fatty acids in the form of magma (or paste). This is placed in filters and treated with acid and alkali, and pressed, with the aid of heat, to separate the fatty acids. The fatty acids are distilled in stills lined with a metal or alloy not acted on by oil, a steam jet or exhauster assisting in the discharge of the vapors.

India-rubber Varnish.—Dr. Elder gives the following recipe for making India-rubber varnish: Inclose 30 grams of finely-cut caoutchouc in a capacious linen bag, and suspend this within a flask containing a liter of benzine, by means of a thread held fast by the stopper so that the bag remains near the surface of the liquid. In the course of six or eight days, the soluble portion of the caoutchouc—about 40% to 60%—will pass into the benzine, while the contents of the bag will expand enormously. The clear solution, which is quite viscous, and contains 1.2% to 1.5% of caoutchouc, is then carefully separated. The swelled contents of the bag retain one-fourth to one-third of the benzine used, and may be utilized for the preparation of an inferior kind of varnish. A solution of India rubber in benzine, kept in half-full bottles, is decomposed on exposure to light, which may be seen by the change in the solution from a viscous to a thin fluid condition. Even in the dark this change goes on, but it takes about three times as long.

Good Health.

Pin Worms and How to Get Rid of Them.

A correspondent of the *Scientific American* propounds the following: It is exceedingly desirable that people should know more of the history of *Ascaris vermicularis* (pin worm). Encyclopedias give everything about them excepting what we ought to know, even the pictures. Please give us a paper on the subject, not for scientists, but for parents. I am a man 60 years old, and shall die of them. I know of no relief for their poison but cool injections. Every few weeks they produce diarrhœa, and the visible surface of my outflow will give 50 to the square inch, to say nothing of the millions out of sight. After these liberal outflows there is a *short* relief, but only *short*. We wish to know:

1. Where is their original home?
2. How do they enter our body?
3. How many days' incubation?
4. How many days' life?
5. Are not the eggs laid inside as well as outside the bowels?
6. Is it certain that they occupy only about five inches of the rectum?
7. How to be rid of the few left for seed after every looseness?
8. If derived from food, why all persons are not infected?

A correspondent of that paper replies as follows:

I take pleasure in giving your correspondent the benefit of a protracted investigation of pin worms, which resulted in their complete and permanent extermination in the case in which I was immediately interested.

Like all the myraid parasites which afflict humanity, the pin worm probably came to man by migration from some of his poorer relations of the strictly animal world; it is not reasonable to suppose that Adam had them all.

It is commonly held that transmission is now made by the mouth, the eggs being taken in water or on infected food handled by persons afflicted with worms.

The eggs have been found under the finger nails of children and others troubled with pin worms. It is also on record that the worms have been found in the intestines of infants dead *in utero*, indicating either spontaneous generation or the circulation of the eggs in the blood of the mother.

The period of incubation is uncertain, probably three or four days, as it takes about a week for the intestinal tract to become infested after a thorough evacuation of its contents.

The belief that the worms inhabit the rectum only is a mistake. The breeding place of the pest is the cæcum, whence the worms descend or are involuntarily carried to the lower bowels and rectum. For this reason ordinary injections and medicines taken by the mouth afford only temporary relief. To exterminate the pest they must be reached (and the females killed) in the cæcum, particularly in that portion not purged when the intestinal tract is cleared in the ordinary way.

The simplest means of killing the worms the writer discovered by experiment to be by their immersion in *pure water*. Used to the denser secretions of the intestinal tract, the worms absorb water by endosmosis until they burst. Hence the rational and effective remedy by drowning the pests with copious injections of tepid water after the intestinal tract has been thoroughly washed out, the injections being ample enough to surely flood the cæcum.

The injection should be made while the patient is lying on the back; perhaps most comfortable and effectively while lying in the bath. It is best not to depend upon a single irrigation of the cæcum, or some worms may escape in folds of the lining, or eggs enough may be left to perpetuate the pest. A second flooding should be resorted to in three or four days, and to make assurance doubly sure, the flooding may be repeated once a week for several weeks. With patience and care a perfect and permanent cure can be effected. If your correspondent's physician finds nothing to render the treatment suggested inadvisable in his case, he can count on certain and immediate relief.—*Experience.*

Air Disinfection.—There is much ignorance in regard to the proper disinfection of the air of rooms, etc. *Good Health*, in speaking upon this subject, says: The prevalent idea that the odor of carbolic acid, chloride of lime, creosote, or tea, is a disinfectant, is productive of mischief, sometimes of very great injury. The fact is, they are all worthless as air disinfectants. They produce what many seem to regard as a "healthy smell," but there is abundant evidence that such a smell, while comforting to the mind, may be wholly devoid of protecting value for the body. Disease germs thrive as well in the presence of such odors as when they are wholly absent. The only satisfactory methods of disinfecting the air of a room are the generation of ozone and producing a disinfecting spray with an atomizer. A strong solution of permanganate of potash, sulphate of zinc, bromo-chloralum, or carbolic acid may be employed. The spray should be kept up for some hours. In fact, in a sick-room it is well to keep such a spray in operation constantly, avoiding, of course, so continuous a use or such strong solutions as may become a source of irritation and annoyance to the sick one. Scrupulous cleanliness and thorough ventilation are means of disinfection which are both the best and the cheapest.

Gas Works as Health Resorts.—A few years ago there was quite a mania for frequenting gas works among persons afflicted with any sort of pulmonary disease, particularly bronchial troubles, asthma, chronic bronchitis, etc. The odors always present in the vicinity of these establishments was also recommended for whooping-cough. An eminent French physician has been investigating the matter in a common-sense manner, and reports that animals subjected for some time to the odors referred to, in the purifying chambers of gas works, were found after death to have their lungs filled with tubercles. This is certainly not a very powerful argument in favor of gas works as health resorts. We cannot recommend them, notwithstanding the opinions of an esteemed correspondent.—*Good Health.*

Baldness.—There are several varieties of baldness which are not equally curable. The baldness which results from a fever or other acute malady usually disappears in a few weeks or months. Baldness resulting from dyspepsia is usually curable after recovery of the general health. Patchy baldness, a baldness which appears in spots, is a nervous disease, and usually incurable. When the bald spot is smooth and shiny, with an entire absence of hair, or nearly so, recovery may not be looked for from any remedy or plan of treatment known. Improvement of the general health, with daily friction of the scalp with cold water and a soft brush, will accomplish as much in the line of permanent benefit as can be done in any case. Hair restoratives are nearly all poisonous and dangerous.—*Good Health.*

The Eye in Insanity.—The London *Lancet* states that there are "no appearances of the eyes worthy of a moment's notice in the diagnosis of insanity. The "wildness," "unnatural brightness," "dullness," "vacancy," etc., so frequently mentioned in certificates of insanity, are utterly groundless as evidences of mental "unsoundness." The writer adds that "there is incomparably more restlessness, vacuity and the like in the eyes of the sane than in those of the insane."

Antagonistic Woods.—It is said that certain kinds of wood, although of great intrinsic durability, act upon other woods of equal durability in such a way as to induce mutual destruction. Experiments with walnut and cypress, and cypress and cedar, prove that they will rot each other while joined together, but on separation the rot will cease, and the timbers remain perfectly sound for a long period.

The most unhealthy city in the world is St. Petersburg, in which one-twentieth of all the inhabitants die annually.

MINING AND SCIENTIFIC PRESS

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SAN FRANCISCO:

Saturday Morning, May 13, 1882.

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Passing Events.

There is just now going on a great rush to Wood River, Idaho, and to Butte, Montana—particularly to the former. We mention some facts connected with the mines in another column. The Wood River *Miner* says that so great is the rush into that section at present that the stage lines running between Wood River and the railroads are unable to carry more than half the passengers booked for towns along the river. At Kelton the hotels are full of people awaiting their turn for transportation, while at Blackfoot it is the same. Many private conveyances have been brought into use, and they are now on the way loaded with human freight. Pedestrians in large numbers are scattered all along the Blackfoot and Kelton stage lines.

Dispatches from Siberia announce the finding of Captain De Long and 13 of his companions, dead in the Siberian wastes. The fate of the adventurous men has called forth the deepest regret throughout the country. There is still another boat load of the men who were in the ill-fated *Jeannette*, who have not yet been found and search is being made for traces of them.

The signing of the Chinese Bill by the President was hailed with joy by all classes of the community, and now California can look forward to more permanent prosperity.

The Indian troubles in Arizona are going to keep that region back this summer badly, and the attractions of Idaho and Montana will drive those who intended going north in the opposite direction.

DAKOTA—Production of Deep Mines for the Year Ending May 31, 1880.

COUNTY.	Ore raised during census year.	Average assay value per ton. Gold.	Silver.	Gold and Silver.	Assay value of ore raised during census year. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Custer	2 250	13.89	.07	13.96	31,250	158	31,408
Lawrence	526,998	7.65	.34	7.99	4,032,810	176,080	4,208,396
Pennington	7,500	10.31	.09	10.40	77,200	099	77 989
Total	536,748	7.71	.33	8.04	4 140,856	176,937	4,317,793

COUNTY.	Ore raised and treated.	Average yield per ton. Gold.	Silver.	Gold and Silver.	Bullion produced from ore raised and treated during census year. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Lawrence	495,630	6.33	0.15	6.48	3,137,154	70,563	3,207,717
Pennington	500	3.20	.....	3.20	1,600	.....	1,000
Total	496,130	6.33	.14	6.47	3,138 754	70 563	3.209.317

COUNTY.	Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year. Gold.	Silver.	Total.	Bullion produced during censur year from ore previously raised. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Custer	2 250	81 250	158	31 408	.....	.....	.....
Lawrence	31,368	260 914	31,988	292 902	110,233	.....	110,238
Pennington	7,000	74,880	699	75,529	.....	.....	.....
Total	40 618	360,994	32,845	399 839	110 233	.....	116 233

MONTANA—Production of Deep Mines for the Year Ending May 31, 1880.

COUNTY.	Ore raised during census year.	Average assay value per ton. Gold.	Silver.	Gold and Silver.	Total assay value of ore raised during census year. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Beaver Head	10,934	2.22	96.19	98.41	24,314	1,052,068	1,076,382
Deer Lodge	31,256	6.34	44.19	51.53	514,950	3,672,992	4,187,942
Jefferson	3,335	54.66	29.70	84.36	182,297	99,057	281,354
Lewis and Clarke	10,493	16.18	6.33	22.51	169,819	66,428	236,247
Madison	8,838	28.45	1.40	29.85	*251,498	12,389	*263,887
Total	114,858	9.95	42.68	52.63	1,142,878	4,902,034	6,044,912

COUNTY.	Ore raised and treated.	Average yield per ton. Gold.	Silver.	Gold and silver.	Bullion produced from ore raised and treated during census year. Gold.	Silver.	Totals.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Beaver Head	10,902.0	1.81	66.90	68.71	19,750	729,338	749,088
Deer Lodge	57,029.0	5.92	34.83	40.75	337,729	1,986,067	2,323,796
Jefferson	3,033.0	18.49	24.54	43.03	56,169	74,562	130,731
Lewis and Clarke	10,343.0	12.71	2.44	15.15	131,499	25,281	156,780
Madison	5,264.5	16.49	.07	16.56	86,798	378	87,176
Total	86,576.5	7.30	32.52	39.82	631,945	2,815,626	3.447,571

COUNTY.	Ore raised and treated.	Assay value of ore raised during census year and remaining on hand at close of year. Gold.	Silver.	Total.	Bullion produced during census year from ore previously raised. Gold.	Silver.	Total.
	Tons.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.
Beaver Head	34.0	.....	5,440	5,440	.....	.....	.....
Deer Lodge	24,227.0	121,234	1,101,857	1,223,154	4,200	79,911	84,111
Jefferson	297.0	32,499	3,491	35,990	234	1,330	1,564
Lewis and Clarke	150 0	2,460	776	3,236	.....	.....	.....
Madison	3,573.5	59,611	721	60,332	6,481	.....	6,481
Total	28,281.5	265,864	1,112,285	1,3 8,149	10,915	81,241	92,156

*Estimated.

MONTANA—Ore Treated by Smelting Works and Amalgamating Mills.

	Ore treated.	Average yield per ton. Gold.	Silver.	Gold and Silver.	Bullion produced. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Smelted	14 680.0	.64	78.36	79.00	9 303	1,149,856	1 159,240
Milled	71,896.5	8.65	23.18	31.83	622,552	1,665,770	2,288,322
Total	86 576.5	7.30	32.52	39.82	631,945	2.815 626	3 447,571

MONTANA—Crude Bullion Product for the Year Ending May 31, 1880.

COUNTY.	Gross tons.	Base bullion. Lead. Tons.	Lead. Dolls.	Copper. Tons.	Copper. Dolls.	Precious metal contents. Gold.	Silver.	Total.
						Dollars.	Dollars.	Dollars.
Beaver Head	1,568	1,132.5	101,925	186.25	74,500	.....	727,352	903.777
Deer Lodge	525	.....	.....	420.00	168,000	7,101	207,252	382.3-3
Jefferson	83	81.5	7,335	.....	.....	0,863	39,276	53,474
Total	2,170	1.214.0	109 260	606.25	242 500	13,964	973 880	1,339 604

Lead, $90 per ton. Copper, $400 per ton.

THE Directors of the Hibernia Bank reduced the rate of interest on loans to 6% per annum, the bank paying the mortgage tax. This tax this year will amount to about 2½%, so that really the bank is letting its money at the rate of 3½% per annum. This rate would not be a high interest return in Europe.

ABOUT 3,000,000 Jews live under the government of the Czar, and it is said that "America" is the word oftenest on their tongues. This is the Promised Land to which they look forward, and a plan is on foot to bring 10,000 more of them to this country this year.

A WEEK ago Saturday the Port Blakely mill, at Port Blakely, W. T., eclipsed itself. In twelve hours it turned out 190,000 ft. merchantable lumber. During the week ending on that day, the mill cut a little less than 1,000,000 ft. of lumber. This is claimed to be the largest cut ever made by any one mill west of the Mississippi river. The lumber mills along the sound are all complaining of the great scarcity of hands, white men not being obtainable, and none of them desiring to hire Chinamen.

THE public schools of Gold Hill have closed for want of funds to pay expenses. The district is in debt nearly $4,000.

Production of the Precious Metals.—No. 8.

[An abstract of the Census Monograph on the Bullion output of the country.]

DAKOTA.

The metallic production of Dakota is derived from the region of the Black Hills, and in greater part from Lawrence county, where free-milling gold-quartz ores of low grade are reduced in amalgamating mills of great size. The perfection to which the milling process has been brought is shown by the large percentage of the assay value extracted. Custer and Pennington counties are opening new mines, but had scarcely become producers during the census year.

Dakota Placer Mines.—The following table gives the production of placer mines so far as could be ascertained by the expert in charge of this district. The amount seems very small, compared with the supposed value of the surface deposits in this region. This may be in part accounted for by the fact that several important companies were making ditches, and preparing for work on a large scale, but had not become producers during the census year.

DAKOTA—Production of Placer Mines for the Year Ending May 31, 1880.

County.	Gold.
Lawrence	$47 700
Pennington	3,159
Total	$50,859

MONTANA.

Montana has within its boundaries the elements favorable to a large production of the precious metals—rich and varied ores and abundant fuel, both coal and wood. As yet, however, owing to the lack of development and want of sufficient transportation facilities, it has not taken its proper rank as a producer. Owing to the great extent of territory over which its mines are scattered, and the fact that, from circumstances beyond our control, the collection of statistics was not completed until the winter was far advanced and travel rendered thereby very difficult, the data leave something to desire in point of completeness.

The double-column table in the preceding columns gives the production of the deep mines of Montana by counties, and the yield of the ore treated, as far as could be ascertained, though some small lots of ore are known to have been shipped East, which could not be traced.

The next table shows the relative amounts of ore reduced in stamp mills and by smelting works, with the average yield per ton, and total contents in gold and silver in each case.

Hydraulic and Placer Mines.—The gravel deposits of Montana form an important source of its wealth, and their product is known to be very considerable. The figures for this product have been assumed, in the absence of more reliable data derived from direct information, and are $1,162,908.

The counties from which hydraulic mine returns were received are Deer Lodge, Meagher, Beaver Head, and Lewis and Clarke, the relative amount of production reported from each standing in the order in which they are named above.

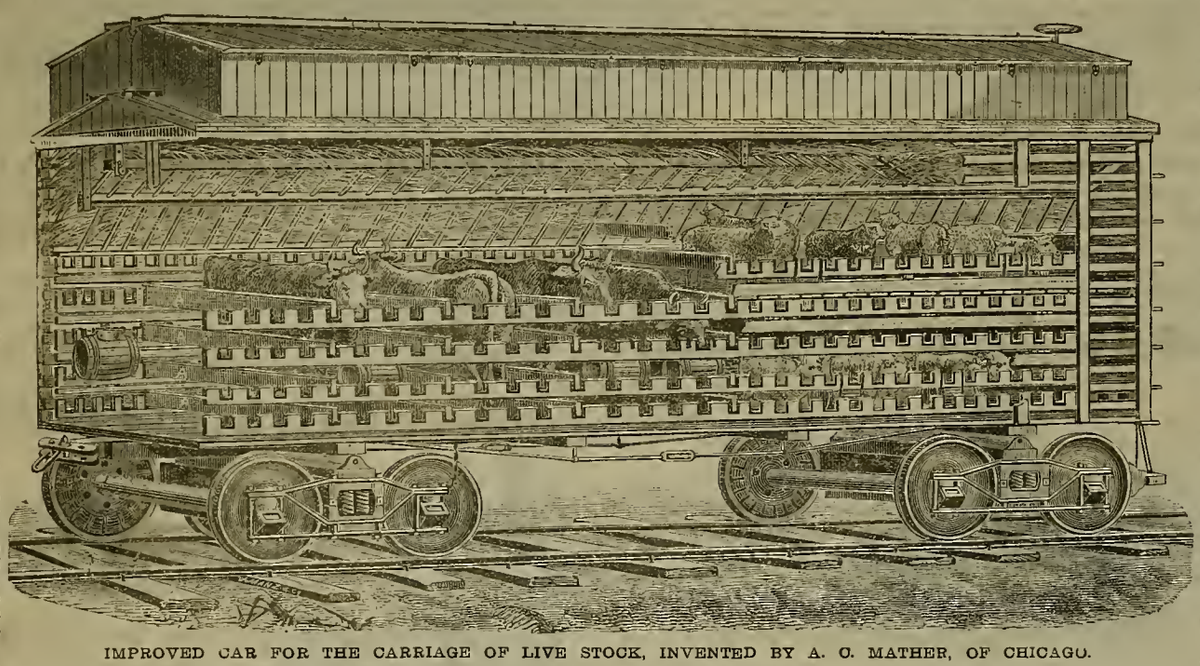
The ores of Montana, like those of Colorado, contain considerable amounts of copper and lead, which cannot be neglected in considering its production of metals. The table below gives the amounts which could be traced, a portion of the copper having been reduced to copper oxide in Colorado. The figures quoted are for crude bullion which was not reduced to the metallic state within the Territory. A certain amount of copper ore was shipped directly East from Montana, but its value or contents could not be ascertained.

AN OLD STORY.—The case of J. Alphonso Carit against William Williams and Andrew Charles, an action for $25,000 damages, is occupying the attention of Judge Allen in Department 3 of the Superior Court. The complaint alleges that the defendants, by aid of exceedingly rich ore, specimen rock and false representations, induced plaintiff to buy stock in the Gold Lead gold and silver mining company, the mine being situated in Nevada, near Virginia City. An expert was subsequently sent up to examine the mine, but the defendants, it is alleged, would not permit him to enter, giving the reason therefor to be that the mine was so rich that the Bonanza firm, upon becoming aware of that fact, by aid of their great wealth, would steal the property; a further reason for refusing entrance to the expert was that he was a friend of the members of the Bonanza firm, and would report to them the immense wealth in sight in the Gold Lead. After the return of the expert the plaintiff, Carit, bought more of the stock, bringing the amount of his investment up to the handsome figure of $21,290. In November, 1880, becoming suspicious that the mine was kept closed for other than the reasons given by defendants, the expert was again sent up to examine the property, but that party met with a rough reception and was driven away. The trustees then took forcible possession of the mine, and upon examination discovered that it was worthless. There was no permanent vein, and the rock was barren. The complaint further alleges that the rich rock, by which the plaintiff was induced to purchase the stock, was taken from some other mine. The case will probably take up the time of Judge Allen for three or four days, and it is said all the mining experts in the city will be called upon to testify.

An Improved Cattle Car.

Our readers will remember the accounts we have published of the efforts made by the American Humane Association to secure a car for the carriage of live stock which would free the animals from the cruelty which attends shipment in the cars usually employed for this purpose. The Humane Society, it will be remembered, did not find any car completely filling their demands, which did not trench upon the rights of inventors, and, therefore, they withheld their award. But their inquiry has brought the abuses in the cattle traffic into prominent notice, and must, therefore, be accounted of public service, for it has stimulated invention, and the result will, doubtless, be great reforms where reforms are sadly needed.

In order to show our readers what has been done in the way of securing a comfortable dining-room and sleeping-car for live stock, we have secured an engraving of one of the most famous devices of this kind, patented recently by A. C. Mather, of Chicago. The advantages claimed for this car are chiefly that it avoids the necessity of unloading stock to feed and water; that stock cannot trample upon or otherwise injure each other, or crowd, or be thrown to one end of the car by sudden stops and starts; that the hay-rack occupies space which is not needed for the stock, and can be raised or lowered to suit the kind of stock desired to be shipped, and put up close to the roof, out of the way, when the car is desired to be used for carrying merchandise, that the water-troughs are simple, strong and easily adjusted or cleaned; that these troughs, and also the bars used for separating the stock, are put out of the way of merchandise, being locked in a box on top of the car; that by avoiding the necessity of stopping or unloading repeatedly to feed and water, much time is saved in transportation, and by providing against hunger, thirst and the infliction of injury by stock upon each other, stock will not lose in weight or in quality of the meat when killed; that by loading the cars as ordinary cars are loaded, and placing the bars between stock afterwards, from outside the car, no trouble is experienced, time lost or danger incurred from entering cars with the animals: that these bars have the advantage of being both light and strong, so no car space is lost, and are so fastened as to prevent all possibility of their becoming loose, and that, as will be seen by examining the illustration, different kinds of stock can be safely and comfortably carried in the same car at the same time. That provision is made against the possibility of fire, by having the space between the five upper slats closed; that extra hay and water is carried in a tight box on top of car and fed through the roof to the animals twice a day with regularity during the entire journey. That these improvements can be put on the present stock-cars, and that the car has shown its value by practical tests en route.



IMPROVED CAR FOR THE CARRIAGE OF LIVE STOCK, INVENTED BY A. C. MATHER, OF CHICAGO.

An experimental trip with one of these cars from Chicago to Boston is described as follows: The car was loaded with 15 large fat cattle, weighing in Chicago 23,210 lbs., as per certificate signed by two witnesses: that none of these cattle were taken out of the car from the time they left Chicago until they arrived in Boston; that they were fed about 18 lbs. of hay per day each, while the car was running, and given from 8 to 10 gallons of water; that they laid down, got up, and were apparently as comfortable as if in a stable; that they were weighed and sold early the following morning after their arrival in Boston, weighing 22,950 lbs., making a total loss of only 260 lbs. on the entire load, or 16½ lbs. per head, where the average loss is from 40 to 60 lbs.; and one car arrived on the same train which was said to have shrunk nearly 90 lbs. per head, but they were unloaded only once between Chicago and Boston, and then given only a bite of hay, as they had to be there for a certain market.

The growing cattle shipping interest on this coast should lead public attention to the claims of improved cars, for it is positively necessary in order to secure good meat for the consumer and the highest profit to the stock grower that the present methods and practices in cattle shipment should be superseded by more humane ways and means.

Foundry Notes.

The foundries of the city are pretty busy just now on mining and other machinery, and some of them are crowded with work. At the Pacific Iron Works the following comprises some of the work which has been recently shipped and in process of construction:

A 30-ton galena furnace and outfit for the Barrangilla company, to be erected near Durango, in Mexico, and a similar-sized copper plant has been furnished to the Castle Creek Copper company, on the Gila river, in Arizona.

There is being furnished another galena smelting furnace of this size, together with refining works, 10-stamp mill, 50 H. P. Wheelock engine, boilers, etc., for the Plumas mine in Sonora, Mexico. Messrs. Nebeker & Eilerback have ordered a 20-ton copper plant to go to Utah. Among other orders received are the following: Three 40-ton copper smelters for the Philadelphia company, Wood River country, Idaho; 40-ton copper smelter for the Pima company in Arizona; 20-ton copper smelter and complete outfit for the Bagudrachi mine, Mexico; 40-ton galena furnace for Bonanza company, New Mexico.

These Water Jacket furnaces for both galena and copper ores, built by Messrs. Rankin, Brayton & Co., have revolutionized this branch of business and added much to the value of this class of mining properties. The advantages demonstrated in these furnaces are facility and cheapness of transportation and construction, and capacity for continuous work. One important feature recently introduced in these Water Jackets is the circulating plates, which increases the durability of the parts, besides lessening the liability to injury and the consequent expense and loss of time for repairs. By the adoption of this invention the circulation of the water is so rapid that the inner surfaces of the plates are kept scoured and entirely free from any incrustation, and also perfect protection is afforded from the effects of mineralized water and also from overheating. There are also several other improvements which make this smelter the most complete and effective of any now made.

These works have also under construction for the Pyramid mine, in New Mexico, a 20-stamp silver mill, which will include a full outfit. They have also been supplying lately a number of hoists and a large amount of miscellaneous work for various localities.

Among other things made a specialty of here are the Wheelock automatic cut-off engines. They have arranged to manufacture these engines for the trade of this coast, and have received numerous orders for engines of this make to replace those of other styles. Messrs. W. B. Hooper & Co., of Guaymas, Mexico, have recently been supplied with a 50 horse-power engine, and another has been furnished the Hollister Flouring Mills, of 100 horse-power capacity. The California Flour Mills in this city have also ordered a 150 horse-power Wheelock.

This engine has some qualities that specially commend it to the mining and manufacturing interests of this coast. It is claimed to approach more nearly the line of theoretical machinery perfection than any other, and its simplicity of construction and perfect automatic action challenge admiration. It is warranted to run for years without any expense in regard to repairs, and without any other attention than such as an ordinary fireman can give it, no mechanical skill being necessary, as they are run with the throttle wide open, and under all conditions of load or pressure are under control of the governor. It is provided with a stop motion, so that in case any derangement occurs in the governor or its attachments, the engine is immediately brought to a stand-still.

The Seventeenth Industrial Exhibition.

The seventeenth industrial exhibition of the Mechanic's Institute will be opened in the new pavilion, in this city, on August 15th, and continue until Sept. 16th. The official notice to exhibitors is as follows.

Applications for space can be made at any time, and should be made as early as possible, at least two weeks previous to the opening of the exhibition.

The pavilion will be opened for the reception of goods from and after Tuesday, August 1st.

Articles can be entered for exhibition or competition, as desired.

No charge of any kind will be made to exhibitors for space. Steam and water will also be furnished free, in reasonable quantities.

Space allotted to applicants and not taken possession of by the arrival of their goods, or otherwise, on or before Friday, August 11th, may be assigned to other exhibitors.

No article on exhibition can be removed until the close; but reasonable facilities for making sales for delivery at the close of the exhibition, will be afforded.

Power will be furnished for driving machinery, from the main line of shafting, which is 2 15-16 inches in diameter, and will make about 110 revolutions per minute. Driving pulleys, 30 inches in diameter, will be furnished free, and in operation three days previous to the opening, and exhibitors of machinery in motion will be required to have their machines in running order on that day.

Pulleys for the main line, if furnished by exhibitors, must be accurately balanced, and have the owner's name plainly marked thereon, and should be received and placed in position by Friday, August 11th, as, up to that time, it can be done without unnecessary labor and inconvenience.

The Board reserves the right to direct the general arrangement of the articles on exhibition, and to regulate the dimensions of all signs and advertisements.

The most effectual means will be taken, through the agency of the police and otherwise, to guard and protect the property on exhibition; and it will be the purpose of the managers to return all articles to the owners without loss or injury. Still, all articles deposited will be at the risk of the owners.

A liberal number of premiums will be awarded, consisting of gold, silver and bronze medals and diplomas.

The announcement of awards will be made by the Board of Managers, on Saturday, September 9th.

All boxes and packages containing articles for the exhibition should be marked: "Seventeenth Industrial Exhibition," San Francisco, with the name and address of the sender. If the freight thereon is paid, it will be taken charge of by the Board, and removed to the exhibition building. Cartage at the expense of the exhibitor. A detailed statement of the contents of each box or package should be enclosed with the same, or sent separately by mail or express.

Blank applications for space, a copy of the rules and regulations, and any other desired information, will be given on application to the Secretary, J. H. Culver, or the Superintendent, J. H. Gilmore, at the office of the exhibition, 27 Post street.

As a result of the boycotting of G. L. Rist, a business man of Turner's Falls, Mass., by the Irish population, on account of his having served on the McMillan grand jury, the Protestants have withdrawn their patronage from all Irish dealers, of which there are a number.

Idaho Mines.

We had a conversation this week with Messrs. D. M. O'Sullivan and J. F. Kramer, of Rocky Bar, Idaho, who are passing through the city on their way to the Santa Rita copper mines, N. M., where they are to erect some machinery. In coming over the road from Rocky Bar to Winnemucca, they met hundreds of men on their way over to the Wood River country, and they give it as the opinion of Idaho men that the region will be overrun this season with a great crowd of people in search of employment, who will be disappointed. There is plenty of room to prospect, but there is not much for laboring men to do. The present supply in that line is sufficient already.

They say that the road from Rocky Bar to Winnemucca—about 370 miles—is pretty rough in places. From Boise to Winnemucca—270 miles—all but about 40 miles is in a fair condition. The distance along the road to Wood river from Winnemucca is a good long one to walk, yet some men are walking it, most men, however, going in on cayuses, with pack animals. From Winnemucca to Boise is 270 miles; from Boise to Mountain Home, 50 miles, and from Mountain Home to Wood river about 75 miles more. This road is lined with men on their way to the Wood River mines.

There is undoubtedly a great extent of country in Idaho to prospect, as most of it is only "coyoted" or scratched over, and there will probably be many discoveries made this season.

These gentlemen say that at Rocky Bar there is only one mine of much prominence—the Ida Ellmore, working systematically. This has been worked at intervals for the past 20 years. It is near the bed of the river, and is troubled with water to a great extent. The mine is now working another new level and will crosscut and drift on the ledge. The company is deserving of success from the expenditures it has made. Last summer they milled some ore; the ore is free milling and easily worked. They expect to start up the mill by the first of July, or possibly in June. They have a nice little mine, well equipped with a good mining plant. Another mine within a few miles is the Vishnu, where they are working a shaft and drifting. They have a nice 2-ft. ledge of free-milling ore, averaging about $40 to $75 per ton. There are a number of prospects around Rocky Bar, but none of prominence.

In the immediate vicinity of Rocky Bar, the gentlemen met Messrs. Thompson and Graham, who were going to Hardscrabble, a few miles from Rocky Bar, with some Burleigh drilling machinery. Col. Graham was going on some 16 miles further to Atalanta, where he has charge of the Last Chance mine, of which they have great expectations.

Some considerable attention is being paid to Snake River again this spring. The gold there is very fine, but of high grade. Some work is being done there now.

Daly Camp.—George Daly, the well-known mining superintendent who was killed by the Indians not long since, has had a mining camp in New Mexico named after him, as will be seen by the following item from a Territorial paper: There is a prospect of a very decided and stirring boom in the Lake Valley mining district, Dona Ana county. The operators are George D. Roberts, of New York, and J. Whitaker Wright, of Philadelphia, both well known as wealthy and shrewd mining men, whether laboring on the stock boards or in the camps. The principal mines at Lake valley have been opened up, under the direction of these men, in such a manner as to expose large bodies of high-grade ore, said to aggregate fully a million in value. The stock of the various companies organized is selling rapidly in the East, and at high figures. The camp has been christened Daly, in recognition of the great service rendered the capitalists mentioned by George Daly, who effected the purchase of these mines, and who was subsequently killed by Indians. The nearest railroad station is Nutt, and the stage line from there to Daly is owned and run by Con. Cosgrove.

Over 200 manufacturing firms of Rochester have formed an Employers' Protection Association against strikers.

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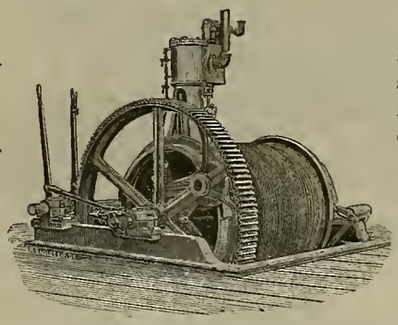

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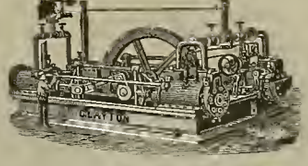

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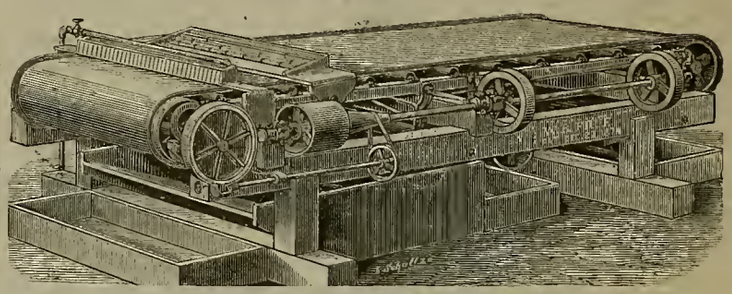

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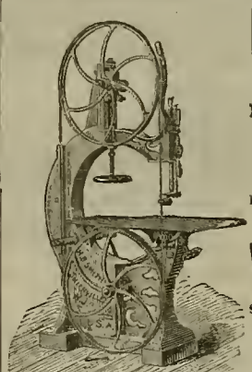

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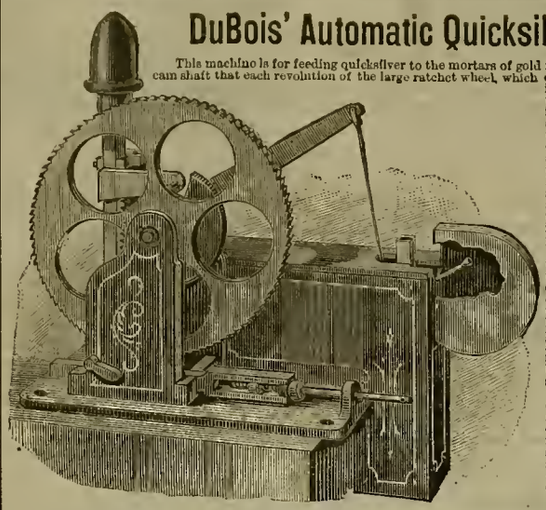

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This power is light and strong, so that two or more horses can be used for crushing ore or other work.
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Comprising a Practical Exposition of the Various Departments of Exploration, Mining, Engineering, Assaying, and Metallurgy,
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING MAY 2, 1882.

257,273—RIDING SADDLE—Joseph Bassler, San Jose, Cal.
257 213—TACK—A. J Culbertson, San Andreas, Cal.
257 306—STATION INDICATOR—Michael Farley, Portland, Oregon.
257,106—WATER AND AIR WHEEL—David B. James, S F.
257 350—POCKET—David Lubin, Sacramento, Cal.
257.351—PIN—David Lubin, Sacramento, Cal.
257 352—ENVELOPE—David Lubin, Sacramento, Cal.
257,173—OIL CUP—John S. McBride, Sacramento, Cal.
257 357 - UNDERGROUND CONDUIT FOR ELECTRIC WIRES—A. F. McGrew, S. F.
257,234—CAR COUPLING—Frank Miller, Olema, Cal.
257 380—SELF ACTING BLOW PIPE LAMP, ETC.—Thos. Poyser, S F.
257 239—UTILIZING SPENT LIMS FOR BRICK AND TILES—E. L. Ransome, S. F.
257,241—PLOW—Milton Ross, San Jose, Cal.
257 244— AR COUPLING—A. Schulenburg, S. F.
257,249—BRAKE BLOCK—Edward O. Spencer, Iowa Hill, Cal.
257 254—TWO WHEELED VEHICLE—Samuel O. Thompson, Santa Rosa, Cal.
257,320—NUT LOCK—Wm. C. Watson, Puyallup, W. T.
257 219—ENDLESS TRACK FOR SEAMING CYLINDERS FOR CANS—Joseph P. Haller, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

ENDLESS TRACK FOR SEAMING CYLINDERS FOR CANS.—Joseph P. Haller. Assigns one-half to S. Wagenheim, San Francisco. No. 257,219. Dated May 2, 1882. For making the body of a can there are usually three operations: First, the material is fitted around a forming or seaming cylinder, its meeting or overlapping edges being held in place by a knife attached to the cylinder. Second, the seam is soldered; and lastly, the knife is raised and the soldered can removed from the cylinder. The work is ordinarily performed by one man, and requires his attention to three distinct operations, so that while using his hands to get the material upon the cylinder, or to remove it, his soldering tools must be laid aside. Therefore, there is loss of time. This method is open to the further objection, that it does not distinguish between work requiring skill and work calling for no skill. The second operation—that of soldering the seams—requires skilled labor, while the simple fashioning upon or removing from the cylinder may be done by boys. This brief statement of the method now employed will serve to show the object of this invention. It is an endless track for seaming cylinders for cans, the object of which is to facilitate the work of soldering or seaming cans, and to make it possible to separate skilled from unskilled labor, whereby more of the former may be utilized. The invention consists of a circular guide or track rigidly bolted upon a table upon which track the seaming cylinders slide. A boy stands at a treadle with a seaming cylinder before him. He presses down a treadle and mechanism raises the knife. He fits the material around the cylinder, and, taking his foot from the treadle, allows the retaining knife to press down and hold the edge. He slides the cylinder along the track and directs his attention to another one. The first cylinder is immediately soldered by the skilled workman, who stands beyond the boy. He slides the cylinder along to another boy, who removes it.

TACK.—Andrew J. Culbertson, San Andreas, Calaveras county. No. 257,213. Dated May 2, 1882. This tack is intended more particularly for securing layers of leather or other material together. The tack is made of copper or other malleable substance, and consists of a round and nearly straight body, with a bar head resembling the letter T, and it has a tapered and slightly flattened point, so that when driven through the leather and into contact with a piece of iron upon the reverse side, this point will be turned back and enter the leather from that side, so as to clinch or rivet it firmly. The tack is specially useful in securing the parts of harness together and in the formation of long, heavy loops, the work being done more quickly than by sewing, and it will not rip.

BRAKE BLOCK.—Edward G. Spencer, Iowa Hill, Placer county. No. 257,249. Dated May 2, 1882. This is an improvement in brake blocks for vehicles, and it consists in the improvement in the details of construction in fastening the block to the brake beam, whereby it is held securely and may be readily removed when necessary. The method of fastening would be difficult to describe without engravings, but it is done by means of clamps and nuts in such a way that it cannot get loose.

TWO-WHEELED VEHICLE—Samuel G. Thompson, Santa Rosa. No. 257,254. Dated May 2, 1882. This invention consists in a peculiar and novel arrangement of the shafts, axle, springs, body and foot-board, whereby the unpleasant motion or jogging of the horse is prevented from being communicated to the wagon. The novel arrangement first consists in hinging the shafts to the axle, thus making their movement an independent one, not communicated to the axle, and also providing for their removal for the substitution of a pole when desired. It consists, next, in providing against the too great play or movement of the seat and axle, which, by reason of not being rigidly fixed to the shafts, would naturally turn unpleasantly. This is accomplished by means of a supplementary spring connection, thus steadying the body by securing it to the shafts, and yet allowing the latter to have their independent play between limits without affecting the body. It also consists in hinging the foot-board and connecting it by a spring with the shafts or cross-bars between them.

CAR COUPLING.—Adolph Schulenberg, S. F. No. 257,244. Dated May 2, 1882. This improved mechanism for coupling or uncoupling cars consists of an arm suspended from a point near its middle beneath the end of one car, having a sort of H-shaped head pivoted to its front end. The lower end of this head is formed to drop through a slot in a bar which projects from the opposite car. A latch is pivoted to the side of this head, and the upper end of the head is connected by a chain with a rod or lever, by which it may be raised out of the slot in the opposite bar, when the latch will hold it up until the cars have been separated. When the cars come together the slotted bar passes beneath the suspended arm, first described, and raises the coupling hook open, gliding beneath it until it reaches a point where the pin will fall through the slot and couple the cars.

PLOW.—Milton Ross, San Jose. No. 257,241. Dated May 2, 1882. This relates more especially to certain improvements in those plows for vineyard and cotton-field work, or in such other places where it requires handling of the team and handles to allow the near and effective approach of the plow to the vines. It consists in such a construction as will enable one to throw the beam over to the other side, or adjust it in such position as may be required, and also to shift the handles to conform to the changed position of the beam.

CAR COUPLING.—Frank Miller, Olema, Marin county. No. 257.234. Dated May 2, 1882. This car-coupling device consists in combination with two horizontal coupling blocks adapted to meet each other and engage under an influence of springs, which impinge upon the back of each other, of peculiar sliding guards lying parallel with the horizontal hooks, which prevent said hooks from parting, and of a means of displacing said guards and throwing the coupling-hooks to one side to uncouple or release the cars.

News in Brief.

GEN. ROSECRANS has presented another petition in the House on the question of taxing imitation sparkling wines.

THE Boston Board of Aldermen have authorized the borrowing of $1,500,000 for the construction of a new system of sewerage in that city.

REAR ADMIRAL JOHN ROGERS died last week. The Admiral was 70 years of age, and for a number of years Supt. of the Naval Observatory.

NEWS of the President's action on the Chinese bill is received with jubilation by the people in the interior, and by the firing of cannon.

A COURIER from the Yellowstone country reports that the Crows are exasperated, and are ordering settlers to leave. However, they do this regularly every spring.

IT now looks as if the national debt reduction for the present fiscal year, ending with next month would amount to the magnificent sum of $150,000,000.

NAVAL officers are almost unanimous in the opinion that it is time now for the Government to stop requiring naval officers to go on expeditions to the north pole.

H. H. WARNER, of Rochester, N. Y., announces three scientific prizes—one for the discovery of comets in Great Britain and America, and two for meteoric stones seen to fall the present year.

A COAL mine has been discovered on the San Jose river, 43 miles from Albuquerque, N. M., on the Atlantic and Pacific road. It shows a vein of eight ft. or more. The mine is only one-quarter of a mile from the railroad.

THE Philadelphia *Times* voices the thoughts of a great many other people when it says: "It should be understood henceforward that people who wish to fool around in the Arctic ocean, must do so not only at their own expense, but at their own risk."

THE Louisiana House of Representatives have adopted a memorial to Congress asking the Federal Government to take charge of the levees. Resolutions of thanks to the President, Congress and Secretary of War, for assistance to the sufferers by the flood, were passed.

Back Numbers Wanted.

We will pay 10 Cents a Copy for the following numbers of the MINING AND SCIENTIFIC PRESS:

Volume, 13; Year, 1866; Number, 1.
" 18; " 1869; " 5.
" 20; " 1870; " 1 and 26.
" 22; " 1871; " 1
" 30; " 1875; " 2, 3, 4, 7, 10, 11, 12, 13 and 15.

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A large cylinder Hoe printing press, for country newspaper work, can be bought cheap by addressing
Press, Box 2361, S. F.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired), be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F. D., at this office.

Laurel Glen Fruit Farm

This place is beautifully located among the hills. A pleasant drive from railroad and beach. Deer and other game abound in the vicinity. A limited number of boarders can be accommodated for the summer and hunting season. The place is especially desirable for ladies with children. Address, for further information, Isaac Dakin, Soquel, Santa Cruz county.

PERSONS receiving a sample copy of the MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

ANNUAL STATISTICIAN of 1882.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 502 Taylor st. Price, $4.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry O. Hanks, State Mineralogist.

A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

Canvassing Agents.

We want several canvassing agents who will make it their business to solicit subscriptions and advertising for our first-class progressive newspapers. Men of ability and experience can secure good pay and permanent employment. Send references and state your past occupation, etc., to the publishers of this paper.

Business Offices and Sunny Rooms to Let.

We have some desirable rooms to let adjoining the offices of this paper which will be rented on favorable terms. Stair entrance, No. 252 Market St. Elevator, No. 12 Front St. Parties wishing offices, etc., will do well to call and see them. DEWEY & CO.

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P. S.—A first-class printer can secure a permanent situation by applying soon. Also, a steady country boy a situation as janitor.

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Two Gold or Silver Mines, with good reports by Mining Engineers of reputation, for customers in England.

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Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Guadalupe Silver Mining Company—Lo-

cation of principal place of business, San Francisco, California. Location of Works, Urique, State of Chihuahua, Mexico.

Notice is hereby given that at a meeting of the Board of Directors, held on the 28th day of April, 1882, an assessment (No. 28) of Fifty dollars ($50) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No 109 California street, Room No. 13, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the fifth day of June, 1882, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the third (3d) day of July, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. WM. BLACKWOOD, Secretary.

Office—No. 109 California street, Room No. 13, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE
SILVER KING MINING COMPANY.

San Francisco, Cal., May 2, 1882.

At a meeting of the Board of Directors of the above named Company, held this day, a dividend (No. 29) of Twenty-Five Cents (25c) per share was declared, payable on Monday, May 15, 1882, at the office of the Company, Room 19, No. 328 Montgomery street, San Francisco, Cal. Transfer Books will close May 10, 1882, at 12 M.

JOSEPH NASH, Secretary.

DIVIDEND NOTICE.

OFFICE OF THE
Standard Consolidated Mining Company.

San Francisco, May 2, 1882.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 41, of seventy-five cents (75c.) per share, was declared, payable on Friday, May 12, 1882, at the office in this city, or at The Farmers' Loan and Trust Company in New York.

WM. WILLIS, Secretary.

Office—Room No. 20, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

KNIGHT WATER WHEEL.

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Stronger, Better and Safer than any other High Explosive

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It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞ Triple Force Caps and all Grades of Fuse.

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The best Nitro-Glycerine Powders manufactured. Having secured large lots of the best imported Glycerine at low prices, we are prepared to offer the mining public the very strongest, most uniform and best Nitro-Glycerine Powder at the very Lowest Rates.

SPECIAL INDUCEMENTS IN PRICES.

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Caps and Fuse of all Grades at Bottom Rates.

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The Company announces the completion of its line March 1, 1882, to CANDELARIA, Columbus Mining District, Esmeralda Co., Nev., 138 miles from Mound House (Junction with Virginia and Truckee Railroad).

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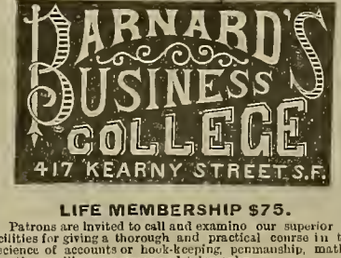
For information on through freight rates apply to

H. M. YERINGTON, Gen'l Supt. D. A. BENDER, Gen'l Freight & Pass. Agent, Carson, Nev.

COMPOUND OXYGEN
NEW TREATMENT BY INHALATION, for Consumption, Asthma, Bronchitis, Dyspepsia, Catarrh, Headache, Debility, Rheumatism, Neuralgia, and all Chronic Nervous Disorders. Prepared by STARKEY & PALEN, Philadelphia, Pa. Package contains all directions, and is easily sent by express; ready for USE AT HOME. H. E. MATHEWS, Forwarding Agent, 606 Montgomery street, San Francisco, Cal. ☞ Send for Free Pamphlets.



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NO ACCIDENT HAS EVER HAPPENED.

ALL POWDERS manufactured by the California Vigorit Powder Co. are SUBMITTED during the course of manufacture TO SCIENTIFIC and accurate TESTS for safety and strength.

They are tested for Safety against Friction, Fire, a Temperature of 212° Fahr., and the various shocks to which Powder is liable in practical handling.

The following qualities are common to all grades of Powder manufactured by the Company:

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If consumers desire it, the EXACT STRENGTH of any Powder shipped to them will be GIVEN IN FOOT POUNDS ☞ Send for Pamphlet showing methods of testing the different qualities of all Powders.

The Company manufactures:

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This is an explosive involving new principles and recently patented. It is the **Strongest Powder ever placed on the Market,** in this country or abroad. It is the **Safest Strong Powder ever made.** For very refractory rock this Powder is the most economical in the market.

VIGORIT, No. 1, XX.

This Powder is **Stronger than the Highest Grades of Hercules or Giant.** It is only surpassed by "Detonite." It is suitable for hard rock.

VIGORIT, No. 1.

For general work this Powder has no superior. It has the advantage over Giant, Hercules or Vulcan in safety and freedom from noxious fumes.

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Equal to any correeponding Grade in the Market.

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This is a Powder suitable for **Bank Blasting, Log Splitting** or the work generally in which Black Powder can be used. It is STRONGER THAN BLACK POWDER, having from twice to ten times the effective strength, depending on resistance. It is **Superior to Judson Powder,** in being more sensitive to the cap and more convenient in handling.

Best Qualities of FUSE and CAPS sold at Loweet Rates.

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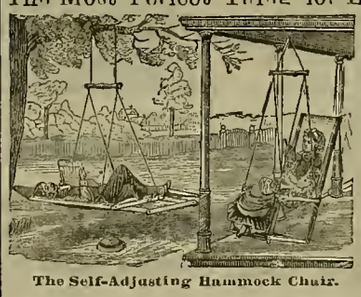

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MORE THAN SIXTY of them are now running on the Pacific Coast, giving results never before obtained as regards continuous running, economy of fuel, grade and quality of bullion produced. We are prepared to demonstrate by facts the claims here made.

These Smelters are shipped in a complete state, requiring no brick or stone work, except that for the crucible, thus saving great expense and loss of time in construction.

Complete smelting plants made to order of any capacity and with all the improvements that experience has suggested as valuable in this class of machinery. Skilled and experienced smelters furnished when desired to examine mines and to superintend construction and running of furnaces. Estimates given upon application.

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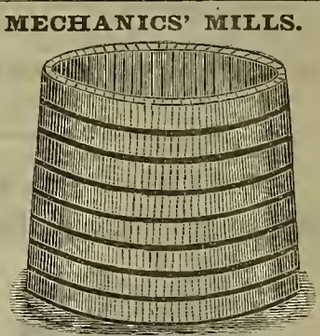

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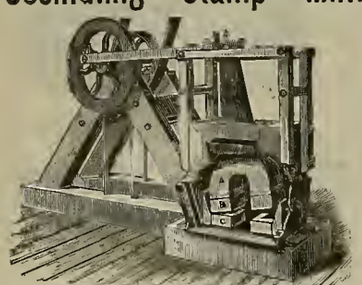
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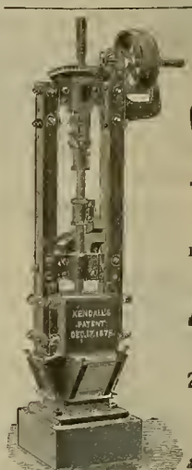
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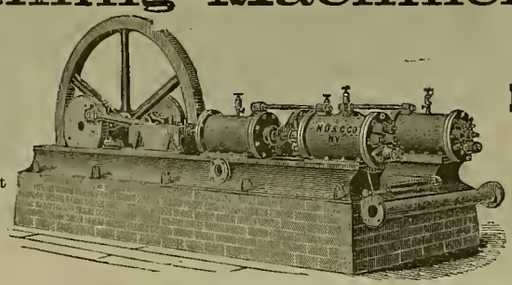

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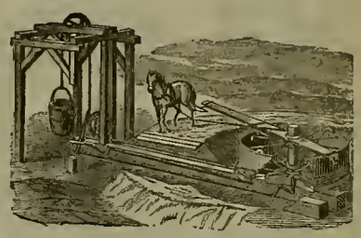

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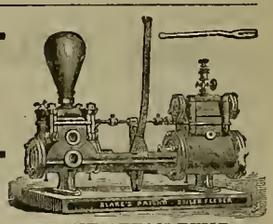

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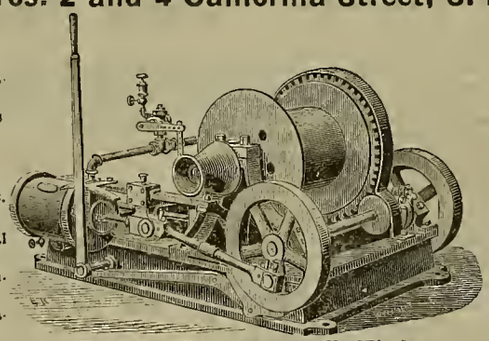

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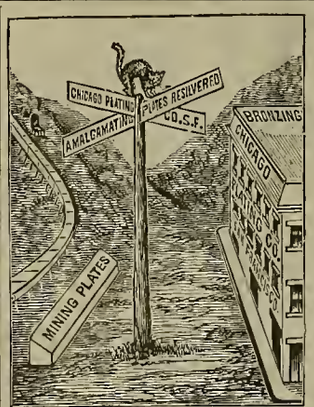

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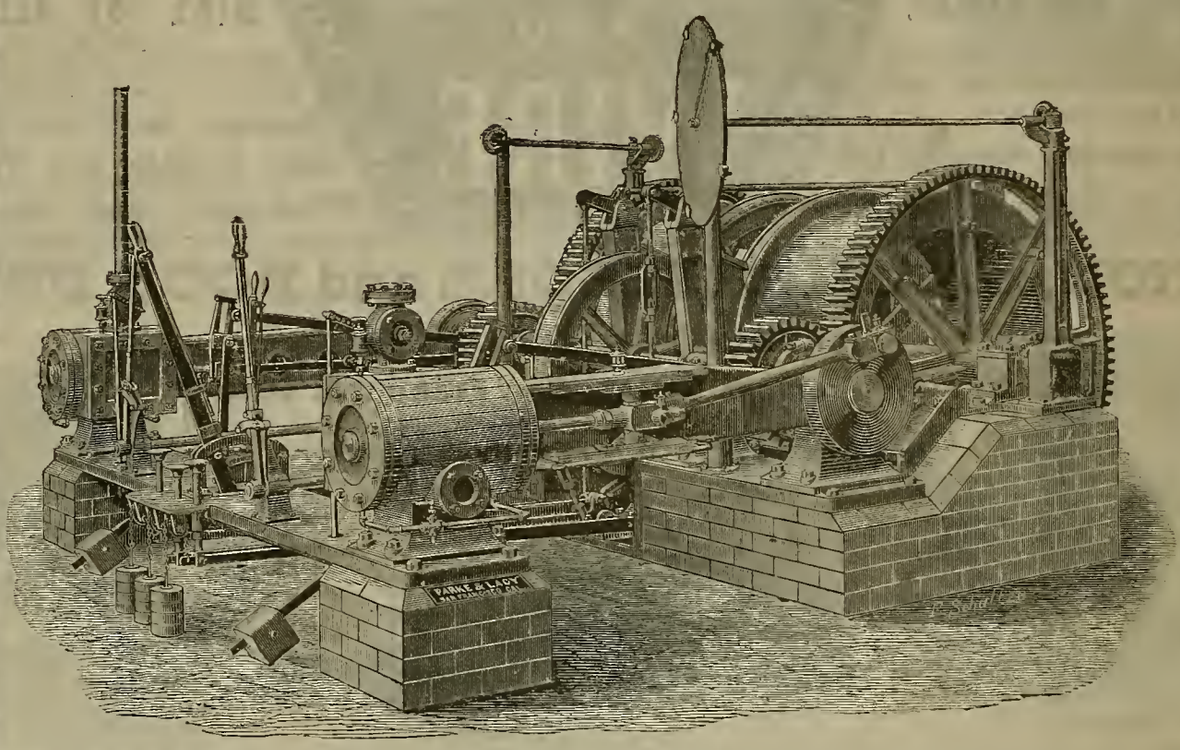

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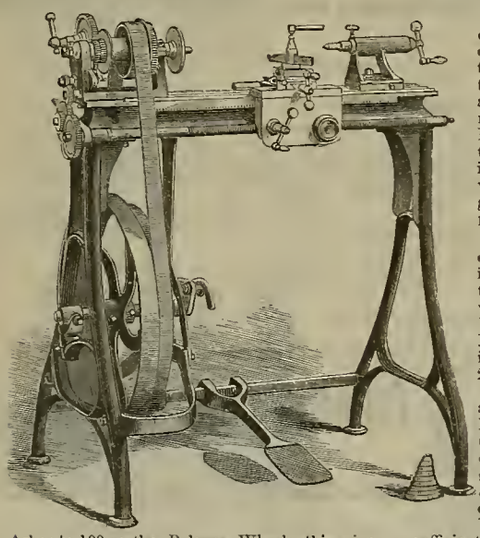

This cut represents a new screw cutting Foot Lathe which was put on the market abont two years ago to meet the demand for a first-class tool at a low price, which will do a great variety of work, both in metal and wood, and is the best Lathe made, considering its capacity and price. The cut gives a good idea of its appearance, and below we give dimensions of parts and general description.

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The Lathe occupies a floor space of 28 by 48 inches, the centers being 44 inches high from the floor; the bed is 48 inches long, 6½ inches wide, 5½ inches deep, with double Vs. for Carriage and Tail Stock. It swings 10 inches over bed and 6 inches over carriage, and will turn 26 inches long.

The Head Stock is back geared, and the Cone has three speeds for 1½ inch belt, the smaller being 3 inches diameter, the larger 6 inches diameter; this, with the back gears gives six different speeds, the fastest giving abont 1,000 revolutions of the Arbor to 100 of the Balance Wheel; and the slowest, 75 of the Arbor to 100 of the Balance Wheel; this gives a sufficient range for all kinds of work.

The Arbor in Head Stock has a ⅝ inch hole through it, which is very convenient for turning the ends of long rods, making small screws, studs, &c. The Centres are ½ inch diameter. There is an attachment in Head Stock for reversing the motion of Carriage.

The carriage has a rack and pinion for moving it by hand, and a split nut moved by a cam on the face of Carriage to throw it in gear with screw; the reversing motion is in Head Stock.

The Tool Post has a slot for tools ⅝x1¼ inches; the tool is adjusted by a wedge made on the arc of a circle and fitted to a convex washer. The leading screw runs the whole length of Lathe, and has 10 threads to the inch. A set of gears go with the lathe which will cut all common threads and a great variety of other sizes by compounding them; there is a screw stop on the Carriage for screw cutting, &c.

The Tail Stock can be set over for turning tapers, &c. The spindle of Tail Stock is 1 1-16 inches diameter, and has a motion of 3 inches. The center is fitted to a taper hole, which is the method adopted by all the best makers, and is the same size as the one in Head Stock, so that chucks and other tools fitted to one can be used in the other.

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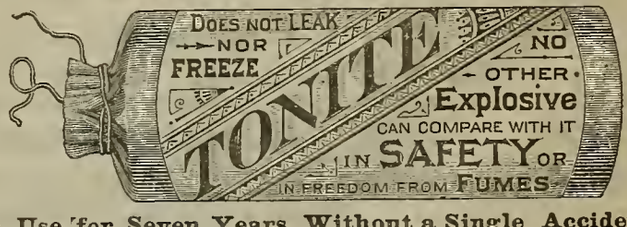

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SAN FRANCISCO, SATURDAY, MAY 20, 1882.

VOLUME XLIV Number 20

Extraction of Lead from Ore.

In the various lead-smelting districts of the world, it is strange to note the variety of methods of reduction in vogue, the various classes of furnaces employed, as well as the differences in fluxes and fuel, etc., employed in each district in the common object of separating the lead from the gangue. It is found, however, that each one of the various methods pursued and furnaces employed has usually special advantages to recommend it for adoption in that particular locality; and that frequently a furnace or method which in one locality appears to work more satisfactorily and afford a better result than another working in a different locality, would, if transferred to the new district and worked under the altered conditions of ore, fuel and flux, prove an entire failure.

The considerations which then determine the method of reduction to be pursued and the furnace to be employed in the smelting of the lead ore of any locality are: First, the nature and yield of the ore to be treated; second, the character of the gangue or vein stuff; third, the nature of the available fluxes; fourth and most important, nature and abundance of fuel in the district; and fifth, means of transportation of material.

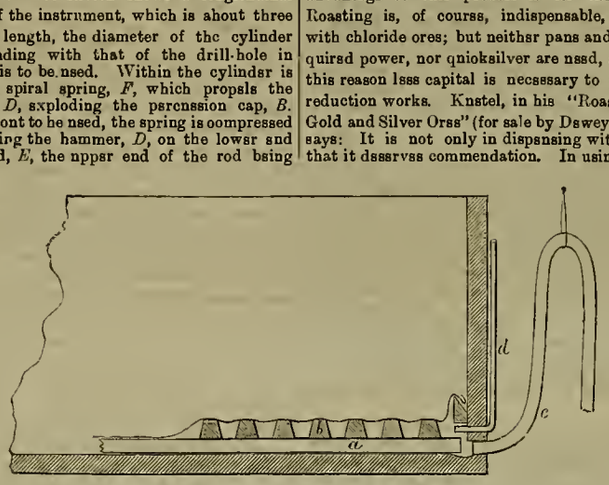
The processes employed for the smelting of lead ores may be classed according to the type of furnace employed, as, according to Greenwood, first, the methods of smelting in England, France and Carinthia; second, the methods in which cupola furnaces are employed, as practiced in the Hartz, Silesia, etc.; and third, the methods of reduction in open hearths, as in the ore furnace or Scotch hearth, and the American hearth. But Dr. Percy supersedes these classifications by grouping the various processes employed for the smelting of galena or other sulphur compounds of lead under three types, according to the agent employed to effect the decomposition of the ore and the separation of the lead, thus: First, "air reduction processes," in which atmospheric air, aided by heat, forms the reducing agent; second, the "iron reduction or precipitation process," in which iron, or an oxidized compound of iron which, under the furnace conditions yields iron, is employed for the separation of lead; third, the method of "roasting with subsequent deoxidation of the product by carbonaceous matters;" while, fourth, for the smelting of ores of lead, such as carbonates, silicates and oxides in which the metal exists wholly in the oxidized state, it is necessary to reduce the metal either by carbon or iron, or both of these agents may be employed.

Impurities in Commercial Copper.

The usual impurities occurring in the copper of commerce are iron, arsenic and silver in small quantities, almost invariably; bismuth very frequently, except in Russian and Australian specimens; tin, antimony and sulphur occasionally, and lead almost invariably in sheet or bolt copper, with nickel, cobalt and gold less frequently. The variety known to commerce as best selected is very nearly pure; while tile copper and tough cake usually contain traces of arsenic, iron, sulphur, nickel, tin, etc. The effect of iron is to render the copper harder and paler in color; sulphur and antimony likewise harden copper, make it grayer in color and impair its malleability and tenacity. Copper containing 10 ounces of antimony per ton is stated by Dr. Miller to be quite unfit for use in the preparation of brass intended for rolling. Arsenic in small quantities hardens the metal, but does not impair its malleability to the same extent as antimony; while the presence of bismuth deteriorates the toughness of the metal, and produces a "red-short" copper. Red oxide of copper renders the metal both red and "cold-short." Small quantities of lead are occasionally added to copper intended for rolling, but the addition of only small quantities (1% to 2%) of this metal renders copper unfit for the manufacture of brass plate and wire.

Automatic Exploder.

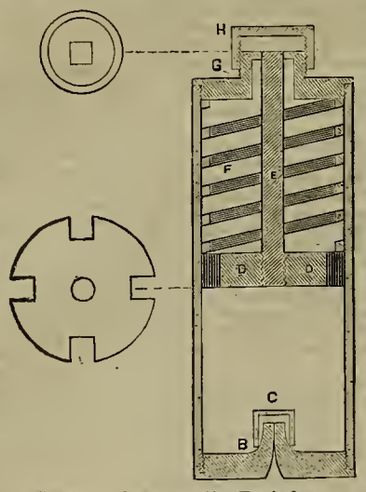
The instrument illustrated on this page is designed as an economical substitute for fuse and battery in the firing of dynamite and other explosives. The sketch shows a longitudinal section of the instrument, which is about three inches in length, the diameter of the cylinder corresponding with that of the drill-hole in which it is to be used. Within the cylinder is a strong spiral spring, *F*, which propels the hammer, *D*, exploding the percussion cap, *B*. When about to be used, the spring is compressed by screwing the hammer, *D*, on the lower end of the rod, *E*, the upper end of the rod being



BOX FOR LIXIVIATION BY AID OF SUCTION.

let into and secured to the flange, *G*, by means of solder, which is easily amalgamated with quicksilver. The cover, *H*, being removed, a drop of quicksilver is placed therein, and it is screwed on to the top of the cylinder. The instrument is then deposited in the drill-hole over the charge, the lower end being in contact with the dynamite. The action of the quicksilver on the solder releases the spring, and the hammer effects the percussion, the length of time being regulated by the depth of the soldered joint at *G*, which may be filed down so as to accomplish the explosion in 10 minutes or less, thus serving all the purposes of a "timefuse."

One of these small instruments is, of course, required for each charge. If, as is claimed by the patentee, their manufacture can be reduced to about 10 cents each, there is every probability that they will be a convenient and economical substitute for the present mode of firing by means of the ordinary fuse or the battery, more especially in submarine blasting and in situations where the presence of dangerous gases oftentimes precludes the use of a naked light, as in coal mines.



Section of Automatic Exploder.

In the efficient explosion of dynamite, much depends upon the perfection of the initial explosion of the percussion cap. By the ordinary method of applying the fuse to the cap, a portion of the effect is lost by the fusion of the fulminate, and it may be reasonably supposed that a smaller amount of fulminate, where percussion instead of fusion is employed, will have an equal effect. The experiments made by the patentee of the "Automatic Exploder" go to show that a single force percussion cap, if fired by percussion, is nearly equal in effect to a triple-force cap, if fired by fusion. Should this be the case, then additional safety would be secured in the handling of triple-force caps, which, to the miner, would be a desideratum.

THERE is a big "rush" to Wood River.

Applicability of the Lixiviation Process.

All silver ores which allow a good chlorination in the furnace, and which permit filtration, are suitable for the lixiviation process. A great advantage of this process is its cheapness. Roasting is, of course, indispensable, except with chloride ores; but neither pans and the required power, nor quicksilver are used, and for this reason less capital is necessary to put up reduction works. Kustel, in his "Roasting of Gold and Silver Ores" (for sale by Dewey & Co.), says: It is not only in dispensing with pans that it deserves commendation. In using pans there is gearing, belting and other parts exposed to breakage; the pans wear out in time, especially with base roasted ores. The cost of quicksilver itself is not great, provided it has not to be transported too far; but this process is important in localities where lime and sulphur can be got in the neighborhood, while the transportation of quicksilver is troublesome and costly. The process, although a little more complicated than the pan amalgamation, and requiring more time, is nevertheless simple and more easily learned. Ores containing much clay and lime, or talc, filter very slowly, sometimes so slowly that pan amalgamation must be preferred. The remedy in such case is found in separation of the mud or slime from the coarser sandy part. The crushing, therefore, must be changed to wet crushing, and the separation must be effected either through pointed boxes or some other arrangement, where the flow of water is swift enough to carry the fine stuff further than the sandy part. This latter, for the purpose of roasting, must be dried. Generally, it is charged wet in a roasting furnace with two or three hearths. In this case, the salt is added when the ore is in the last hearth. But then comes the inconvenience of handling the slimes. In Mexico, this part can be subjected to the patio amalgamation, provided the silver comes out by this process, and in the United States the slime, on account of its extreme fineness, may admit a direct pan amalgamation; but in either case a double manipulation is very inconvenient. The proposal to treat such ore without separation in an agitator with a filtering bottom may perhaps answer in some instances; but this point must be decided by experiments.

Ore that permits filtration, but too slowly, can be leached much quicker with hot solutions, to begin with hot water; but the hot water in the beginning dissolves more chloride of silver than cold water.

Lixiviation, with aid of suction, is a great advantage where it can be arranged. The leaching boxes must be located 10 to 12 ft. above the precipitating vats. The arrangement is represented by the engraving.

The hose, *c*, is inserted at the lowest point of the vat below the false bottom; then there is a glass pipe, *d*, reaching outside near the rim of the vat. The hose, before commencing, is likewise lifted as high as the glass tube. *a* represents the first staves on the bottom of the vat, and *b* the second row which is covered with the cloth. After the vat is filled with ore and the water admitted, the air below the false bottom escapes through both pipes; but after awhile, when the water rises and covers the mouth of the hose, the air from between the upper staves goes through the glass tube and is followed by the water. When this reaches the water-level inside the tank, the tube is shut up by a tight stopper and the hose lowered down to the precipitating vats. The lixiviation is much quicker than without suction, but if the hose should be so wide that more water escapes than can follow, there will be, of course, no suction.

Amalgamation in Kettles.

The method of amalgamation of silver in kettles is only applicable to the treatment of certain comparatively rich ores containing chloride, iodide and bromide of silver, accompanied also by native silver. It is chiefly in use in South America, but could, of course, be adopted here in such places as the ores above described are found, and where it was thought convenient. The method is sometimes called hot amalgamation. The ores are treated in kettles with copper bottoms whereby the silver is precipitated from its chloride, iodide or bromids, and subsequently amalgamated by the addition of mercury.

To carry out the process, the ores are first crushed and ground to a fine powder, concentrated, if necessary, by careful washing, and then mixed with a large proportion of water, thus forming a thin mud, which is introduced into kettles or boilers provided with copper bottoms. The contents of the kettle are now heated to boiling by a wood fire maintained beneath the kettle, when from 10% to 15% of common salt is mixed with the charge, after which a quantity of mercury is added and incorporated with the mixture by continuous stirring, the temperature of the contents of the kettle being kept up throughout the process, while samples of the amalgam are removed at intervals, and from their examination the attendant determines when the amalgamation is completed; as also whether any, and how much more mercury it is necessary to add to complete the operation, the whole treatment lasting five or six hours. The amalgam thus obtained is treated according to the method common everywhere, the silver produced requiring to be fused and refined before casting into bars, while the earthy residue left after the separation of the amalgam frequently retains enough silver to make it profitable to work it by "amalgamation in heaps." The consumption of mercury in this process is usually somewhat less than the weight of the silver extracted.

SOME time ago an attachment was issued against the Stormont mill property, at Silver Reef, and it was feared that this might have the effect to stop the production of bullion for a time. The attachment has been withdrawn, and matters have been adjusted.

THE Calumet and Hecla Copper Mining Company of Michigan paid a quarterly dividend of $5 per share, or $500,000, at Boston, on the 15th. This makes $21,350,000 in dividends to date.

THE mines at Gold Park are looking well and improving as work progresses. The 10-stamp mill is running steadily up to its fullest capacity, and everything wears a prosperous look.

THE Esmeralda *Herald* says: It is rumored that Rhodes and Wasson's salt marsh has been sold to the Carson and Colorado railroad company. Consideration, $150,000.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Nevada County Gravel Channels.

The Blind Miner's Theories.

EDITORS PRESS:—I wish to try to give you a clear and rsliable visw of the sitnation here. Now, I offsr you nothing only that which I know to be the facts without the least sxaggeration, and if you are not interested yourself, will you be clever enongh to hand it to some person that will be likely to raise a compaay to hslp ms. I intend sticking to my friends and to those who hslp me until they ars satisiied, and indifferent persons may run their guess-work till they have enongh of it, and then quit. Now, I own 2,400 ft. on the Alta channel, and all but five-twenty-fourths belongs to me, the most of which belongs to a woman that has done all she could, but is willing to do more; the rest I owe for tramping to Grass Valley 50 times. Now, this covers three positive depoeits and one negative on the Alta, and one emall deposit in the month of the Jenny Lind. Now, 2,400 ft. cannot be made to cover that much money anywhere else on the Alta, and it will be more likely to yield over $1,000,000 than under, and will be a cheap claim to work, well ventilated, well drained, and will need but little timbering—altogether one of the best situated claims in my knowing. Now, I have a tunnel in under the hed of the channel, between a second and a first-class deposit as you go down etream. It makes a good deal of difference whether you are between a second-class and a firet-class, and a firet-class and a second-class deposit as you go down stream. I was about 500 ft. either way to a positive deposit, and no lead connecting that would belp me; but had I understood in tbe first place how a first-class deposit was formed, my partners never could have driven me to have gone after it. As it was, I held out two yeare and five monthe without driving my tunnel an inch, and did all the work to hold the claim myeelf, without receiving a cent, for I knew I did not know how it was formed, and told them so; and yet I could tell that it was there, aud did not want to go after it until I had money, and my whole disaster was caused by the want of $3 in money to buy a keg of powder to start low enough. Now my tnnnels after my upper deposits are all right. I am in about 450 ft., and within about 50 or 100 ft. of the deposit, everything looking all right. Thie is my middle, positive, but I have followed the lead in a small tuuuel abont 200 ft. away from my air draft, and this deposit is not in the channel. What I want to do is to start right in the channel in gray gravel, and drive right up the channel parallel to my upper tunnel, and in about 150 ft. I will tap negative gravel. Tbis is a large body of gravel tbat will pay from $2 to one-half oz. per day; after that, it will pay its own expenses, and as soon as I reach the lead opposite the end of my upper tunnel, I will follow tbe lead up to the deposit and connect the two tunnels. This will open everything, drain everything and ventilate everything, and I will have one of the finest gravel mines that ever was near Grass Valley. The tunnel will be dry, need no timbering until we etrike the pay gravel at least, and a man can make about three ft. a day.

Now, I will give an interest that will guarantee $10,000, or I will make it up out of my share; bnt the facts are, it will yield abont $40,000 instead of $10,000, clear of all expenses. But tbat will be so mnch tbe better for me, and I will take $1,000 for this interest. This will enable me to open my claim; that's what I want it for.

I hold another claim of one mile in length, that will yield about $3,000,000 or $4,000,000. It contains four positive deposits and two negatives; it is spleuidldy situated, and will be a cheap claim to work. It will take about 500 ft. of tunnel to tap one of the largest deposits, to my knowledge, in tbese hills, and will cost about $3,000, and then this will yield money enough rapidly to open all the rest. Each deposit will need a tunnel of its own. Then this will be one of the finest mines in this county. I will give one-half of this claim to the company on any terme that will open it. We need no incorporation, only a joint stock company, for as soon as we get started, we will prodnce capital of our own as fast as we need it. We will not come in contact with either law or lawyers; this kind of cattle we want nothing to do with, for we cau and will corral all our tailings; we do not want rily water to ruu away from them. I have a good ditch right at tbe mouth of my Alta tunnel.

There are 17 deposits on this chauuel, including those I hold, besides the negatives, and I believe I could secure every one of them for less. thau $50,000, and open them all with a good tunnel without a dollar of assessments, provided I had the money to secure them at once on the sly, and I don't believe they will yield a cent less than $10,000,000.

All California lies before us full of deposits, and nothing but gness-work to work against, and no excuse at all to come in contact with that worst of scourges, with all its winks and blinks, "the United Bar Association."

Randolph Flat. H. CLENDENEN.

The Iowa Hill Mines.

EDITORS PRESS:—To rssume my account of quartz and drift mines in the Iowa Hill district: The Copper Bottom Co., on Succor flat, is opening up soms very promising ground, though its tunnel is only in soms 300 ft. This claim has not been worksd for several years, but I presume the good results obtained in the adjoining claim (the Succor Flat) has induced them to opsn up some ground, and try tbsir luck. Thsy have considerable pay dirt on the dump, which they will wash up soon. Only two men are employed there at present.

Succor Flat

Has also some quartz ledges, a little to the east, on the bank of Shirt-tail canyon. Onc known as the Providentia, formerly the Gray Eagle, was first located in 1852. It is a well-defined ledge, and though it has been claimed by many different partics, until within the last year there has not been sufficient work done to hold two years, much less 30. It has been the subject of some expensive litigation lately, the particulare of which yonr correspondent has not time to enter into in thie communication. Suffice it to say, the law of Congress hae been maintained, and the property is now in the hands of men of progress. The obstructioniste bave been pushed to the wall, and from an obscnre bunch of white rock a good paying property is likely to be developed, that will assist to pay the expenses of running our county. Some experienced parties in San Francisco, I nnderstand, have taken hold of it. The work done has developed a fine body of ore. Instructions have been received not to extract any more of it until it could be worked ae it was taken out. The ledge is between four and five feet thick.

A short distance up stream, another location was made last year, known as the Australia. Some very rich float rock was found in early daye in this vicinity. One man has been able to pound ont an ounce in a day. But diligent search failed to discover the source of the float. Last spring parties from Colfax flattered themselves they had it; cleaned out and retimbered an old tunnel, wbich, it would seem, had been run parallel with the ledge. The qnartz lay nearly horizontal. The country seems to have been much disturbed, as many of the steep sides of our canyons are. I think it will be necessary to extend the tunnel into the hill some distance, where they will find out what their mine looks like.

On the opposite eide of the canyon (Shirt-tail), the ridge which divides it from Snail canyon, there have been several locatione within the last six months. As mnch quartz gold bas been found in the latter-named canyon, I should not be surprised to hear of good ledges being opened soon after the snow goes off. Thie ridge, nnlike the others in the vicinity, is not capped with cement or gravel; it shows the quartz. Thie is all that I can give you on quartz at present, and will return to gravel.

The Rich Deposits

Found by the Succor Flat Co. caused a boom in that vicinity. Some maintained the lead ran one way and some another; old locators commenced to look up their corners; new comere questioned the right of one man to hold 320 acres of Uncle Sam's domain and not work any of it. New locations were made over the old ones, shafts sunk, cabins built, claims "proved up," lawsnits threatened, etc., but when the clerk of the weather treats us to 48 incbee of snow we are compelled to keep quiet for a while at least. Of course, every man has his idea of the "pay channel." Indeed, it is amusing to hear how each one differs.

To open this grounnd it will require a long tunnel or deep shaft. The main object at present seems to he perfect title, when, I preeume, consolidated prospecting will be the order of the day. The Attalus, on the west of the Succor Flat claim, have sunk a ehaft in Little Indian canyon 50 ft. deep, and though thie was 100 ft. lower than where the adjoining claim was being worked, they found the rock pitching off. Work wae suspended, as it was late in the fall, and it was fonnd expensive to handle the water without a pnmp. This is considered by many as a good piece of ground, containing 60 acres.

Down the Divide to the South

Is the Golden Streak Co., a last-year location. They have a ebaft 62 ft. deep, bnt discontinued work to "prove up," who, in conjunction with the Winchester Co., intend to make application for U. S. patent, the papers being now in the attorney's hands. Storm has kept the enrveyors back. These locations are on a line with the wash that many suppose fed Grizzley Flat, once very rich. The Morning Star mine must come next. This compauy commenced to run their first tunnel in '58. After extending into the hill from the eontheast side of Indian canyon, opposite the town of Iowa Hill, some 1,600 feet, they fonnd pay to the left of them, but in lower grounnd, and were consequently compelled to run another tunnel, when, to their agreeable surprise, they came onto pay gravel at 300 ft. I forgot to mention that the second tunnel was etarted eome distance to the north of the first. They concluded that this second strike mnst be continuone with the deep ground they fonnd first, on the strength of which a ten-stamp mill was put up, and for a time they rolled out considerable dust, during which time a curious freak of nature was discovered, in the shape of a crevice between 80 and 90 ft. long, ovsr 100 ft. deep, and only three ft. wids in the widest place; again the walls wonld almost touch. Strangest of all, it was full of "psy dirt." Usually, as many minsrs have found out to their sorrow, thess deep places contain anything but pay. I would like to give you the amount taken ont of this crevics, but I have not got the figures by me. Soon after passing this strange deposit, high rock and immense asbestos boulders were enconntsred, some of these from 12 to 16 ft square. The pay was scattered, and, after spending much time—and this also means money in a gold mine—tbe company got the hydraulic fever, which took sevsral Irish dividends to roducs. It was overcome, however, and soms year and half ago they started their tunnel ahead for ths low ground mentioned as found in first tunnel, since which time 1,800 ft. of the said tunnel have been excavated, at a cost varying from $8 to $12 per ft. An upraise was made some six weeks since, and the old pump shaft was tapped exactly, which reflects much credit to those in charge of the work. The tunnel was still pushed ahead; another "raise" tapped very fine pay gravel; and the old mill, which, in the meantime, had been put in good repair, will soon he heard pounding up the gravel. Tbe energy displayed by this company is very commendable, and it is the wish of many, besides the undereigned, tbat the company may find good pay to pound for years to come. This ie an incorporated company, the greater portion of the stock being owned by parties in Grass Valley, Nevada county. MINER.

Iowa Hill, Cal.

Spenceville Mines, Nevada County.

EDITORS PRESS:—Seeing in your valuable journal tbat you wonld publish any communication in regard to tbe mining industriee of tbe coast, I will try to give you a general outline of the mining being prosecuted in thie district. The San Francisc Copper mining company have worked their mine here for several years, and have recently brought it on a paying basis. It has declared its first dividend under tbe efficient management of W. E. Ellis. The ledge is becoming richer as depth is attained. Other mines in tbis distriot are looking up. The American mining company, two miles from here, are going to erect smelting works, the oppsr being of high grade—90%. It will pay better to work it this way than by leaching process. They have run about 600 ft. of tunnels and drifts in this mine; have also a ledge two ft. wide, rich in gold and eilver, which yields assays upward of $100 per ton.

The Northern Belle, another claim adjoining the American mining company, has good proepects. They have run a tunnel 300 ft. nnder Last Chance hill, and intend to resume work again at an early date. They have three ledges of cropping, from 10 to 15 ft. wide, in the line of the proposed tunnel. Rich copper has been taken out of the Last Chance mine in early days and ehipped to Swansea. The Golden Jacket Gold and Silver mining company have etruck very rich rock in their tunnel on Albion hill; it assays away up in the hundreds. The ledge is two and a half ft. wide, free milling and almost all decomposed. The company are now opening her up, and will pnt up a mill this eummer.

The Cosmopolitan, another claim adjoining the Golden Jacket, hae resumed work. They have a ledge four ft. wide on the surface, and at a depth of 20 ft. have struck rock which assays $70 per ton. In early days, at the base of Albion hill, millions of dollars have been taken ont. Here was situated a mining camp called Poker Hill, and another called Albion City. There is nothing left now but a few old standbys, who work on the old diggings in the rainy eeaeon. They still make very good wages.

The trouble is here we want capital in thie place. I have been in almost every new mining district in Nevada and Utah for the last 12 years, but never eaw a better field for a man of grit than in thie district. I only wonder, with such facilities as we have got here—wood and water plentiful, a mineral belt five miles in width—that it has scarcely been touched. Bat, as "distance lends enchantment to the view," the attention of capitalists hae been attracted towards far-off fields, and tbis part of the country hae been left behind. Not only this place, but nearly all other mining counties in California have never been prospected much for quartz ledges. T. MCCARTHY.

Spenceville, Nevada Co., Cal., April 21st.

THE CENTERVILLE MINES.—A party in from Silver canyon informs us that ex-Senator Spencer, who is now ont there, is inspecting some mines at Centerville, midway between Queen springe aud Anrum. Our informant says it is more than probable that work will soon be resumed there under the direction of Senator Spencer.—*White Pine News.*

THE Wood River exodus has been lively in Cherry Creek for the past few days. While we have lost a few good citizens, most of the emigrants from here are of the class that will not he missed, and that are not likely to add materially to the wealth of any community among wbich they may settle.

Looks Brighter.

There is no denying the fact that the mining and business intsrsts of this sscticu have for several months bsen, not only very dull, but discouraging. And this has been the condition of svery mining section of ths Stste, if we except Eureka. With the opening out of spring, however, the general gloom is being dispellsd, and our own, as well as othsr sections of the Stats, ars putting on a more lively and businsslike appearane. With us, our principal mine, the Star, is now in bstter condition to bs snccsssfully and profitably worked than at any previous time in its history. During ths past wintsr many difficulties had to be overcome in sinking the main shaft in this mine—chief among which was the insufficiency of the pumping machinery. Now a depth of 630 ft. has been reached and a new level started and run eome 30 ft. at tbis depth. About 30 ft. more will tap the vein, which on the level above was very rich. Before the 1st of June the Star will have this new level opened out, and will put beyond all doubt the true value of the mine. It is true, all this could, and should have peen done mouths ago, but the directorate at tbe bay has been lacking in enterprise and energy

The Teacup people are also prospecting their mine, with every indication of being rewarded for their outlay. When they do find it in the Teacup, it'e rich enough to gladden the heart.

The Exchange, we are reliably informed, will soon resume work under new management; anu the Egan company, though with diminished force, are still pegging away.

From Silver Canyon coms ths tidings that an important strike has been made in the Sallie L. tunnel, which will no douht result in considerable work heing done in our sister camp during tbis season.

The old minee at Centerville, midway between Queen Springs and Silver Canyon, have been re located, and ex-Senator Spencer is taking hold of the property and will develop it this summer

The chances are favorable, too, that Ruby Hill will come to tbe front this summer, with a San Francisco company with ample capital to take out and work its already developed wealth. Tbe ores of this district are very rich, and if the mines fall into proper hands, Ruby Hill will yet give a good account of itself. Altogether, the mining and business outlook in this section are a hundred-fold more encouraging than they were n month ngo.—*White Pine News.*

Mines and Mining in New York.

Joe Wasson talks a column or more in tbe Inyo *Independent*, and thus speaks of mining in New York: "Ever since that accursed extra (quinine) session of the Legislature, lese than a year ago, my health has been wretched enough, and since in this noisy, jostling place, with a climate as changeable as a modern civil service reformer, life has been almost intolerablo. An old Latin proverb says a great city is a great desert, and from what I have seen of thie one off and on for yeare past, Death valley wae a paradise alongside. There is plenty of money here for good mining property, but I see that most people succeed or fail in effecting out-and-out salee according as they have time to go and come upon. I should never think of coming to any of these Eastern citics with a mine to sell, unless it possessed a substantial development, on less than one year; and two years if a trip to London were involved. It is a curioue fact, however, tbat owners of minee, prospectors, etc., almost universally want to realize ten-fold on their property in one-tenth of tbe time that they do or would with regard to any other calling in life. There is but a emall percentage of the people bere who know or care anything about mining for the precious metals, and when you expect such people to turn from a business they know all about to one they know nothing of, just hecanse you ask them to, is the essence of human folly. And yet it is those very people who have the money of the country, and not the speculators. Tbe formsr are the game of the latter. But I did not intend to bore you with a sermon on mining or anything else.

CROSSCUTTING WIDE LEDGES.—In most places on the Pacific coast, says the Virginia *Enterprise*, a vein from 10 to 15 ft. in width ie considered big; one 30 to 100 ft. is a monster, and one 200 ft. wide is a thing hardly to be believed in—a thing in which to become lost. What then must he the allowance to be made when a mining superintendent is obliged to search through a vein over 1,000 ft. in width? On the Ophir-Mexican line, at the 2700 level, they have already cnt across the vein a distance of 800 ft. and have as yet seen no eign of an east wall. At the Union, on the 2500, 2600 and 2700 levels it is doubtlese fully as wide; indeed, has been crossed hy nearly the same distance as at the Opbir-Mexican line. In this large ore channel lie whatever ore bodies there may be, like potatoes in a hill or plums in a pudding. Thess ore bodies do not always lie lengthwise or with the stratification of the vein. They sometimes lie across it. The bonanza now being worked on the 2500 level lies almost square across the ore channel. Thus it will be seen that a crosscut may easily miss an ore body that a drift would find.

MECHANICAL PROGRESS.

Case-hardening.

By the term "case-hardening" ie meant that process by which the surface of iron is converted into steel. The art of case-hardening ie a very useful one, and should be thoroughly understood by every smith and worker in metal. By case-hardening the surface of iron may be made harder than the hardest steel, and still retain all ite malleability. One of the prime requirements in case-hardening is, that the article shall be well polished. If the iron ie not quite sound or shows ash-holee, it is hammered over and polished again. The finer the polish which is imparted to the surface, the better will be the results in case-hardening. The articles are next imbedded in coarse charcoal powder in a wrought-iron box, which should be air-tight. Sometimes, instead of a wrought-iron box, a pipe is employed. Thie is really preferable, because it can be turned, thus allowing the heat to be applied more uniformly. After the articles have thus been prepared, the box or pipe is exposed for some 24 hours to a gentle cherry-red heat. Sometimes a flue steam boiler is used for this purpose, or the heat may be obtained in any other place where a fire is maintained uniformly. By exposing the articles to the heat for the period named, a hard surface of about one-eighth of an inch in depth is obtained. If so much time cannot be given to the operation, or if deep hardening is not required, the articles may be imbedded in animal charcoal, or in a mixture of animal charcoal and wood charcoal and exposed for a much le s period of time. Four or five hours will be found sufficient to make a good surface of steel.

It is frequently necessary to case-harden a single article, which necessitates a very different operation from that which we have just been describing. The charcoal is finely pulverized and mixed into a paste with a saturated solution of salt. The tool, whatever it may be, is then well covered with this paste and dried. Over the paste is laid a coating of clay moistened with salt-water, which is also gently dried. The article thus prepared is now exposed to a gradually increasing heat, until it is brought to a bright red, but not beyond it. This heat will be found sufficient to give a fine surface to small objects. In all cases the article is plunged in cold water, when it has been heated the proper time and up to the proper degree.

A quick mode of case-hardening small objects sometimes employed is that in which prussiate of potash is employed. The iron is well polished and heated to a dark red heat. It is then rolled in a box containing powder of the yellow prussiate of potash; or, instead of being rolled, the powder may be sprinkled upon it. In either case, the powder will melt on the surface. The iron is then heated to a bright red and is plunged into cold water. The powder of the prussiate of potash to be used for this purpose is obtained by exposing the crystals to a gentle heat in an open iron box or pot, for the purpose of evaporating the water contained in them. The remainder will be a white powder.

While the operation of case-hardening, as we have described it, is very simple, it is not so easy a matter to select the qualities of iron by which the best results will be obtained. If the iron is of coarse fiber, the hardened and polished surface will be unsound; if the iron is impure, it will be brittle after being hardened. The best iron for the purpose is one of very fine and close grain. The test by which its quality may be determined is as follows:

Heat a piece a little beyond the heat by which it is to be hardened and plunge it into cold water. If it retain its fiber and malleability after this test, and is free from ash-holes, it is safe to conclude that it is entirely suitable for the purpose of case-hardening.—*Blacksmith and Wheelwright.*

A NEW METHOD OF TEMPERING.—A new method of tempering metals has recently been brought to the notice of the French Academy of Sciences by M. Clemandot. It consists in heating the metals to a cherry red, and then compressing them strongly and maintaining the pressure until they have completely cooled. Metals thus treated acquire a great hardness, and so fine a grain that, when polished, they resemble nickel. Compressed steel, like tempered steel, takes the coercive force which gives it the property of being permanently magnetized. As regards the duration of the magnetism, M. Clemandot states that the magnets of the Gower, Bell and Ader telephones, made of this new steel several months ago, have thus far preserved their force. As in ordinary tempering, M. Clemandot thinks the new process produces an amorphism in the metal, and he points out that it will now be possible to graduate a temper by graduating the pressure applied. In experimenting with different steels, he finds those of Allevard always the best for magnetic purposes. Elliptical bars of steel seemed to take the pressure in all their parts, and showed a uniform fracture throughout. M. Clemandot's highly interesting discovery will, without doubt, open an entirely new field of study to electricians and metallurgists, and will prove inestimably useful in the arts.

A New Process for Working Iron.

D. P. Kayner, M. D., of St. Charles, writing to the *Mining Review*, under date of April 13th, says: "A writer in the *Scientific American* supplement suggests that within five years puddled iron will not be manufactured; that malleable iron and steel, manufactured direct from the cast ingot, will supersede its use. The Bessemer processes will, to a great extent, accomplish the result of direct manufacture, his blast operating similarly to the labor of the puddler, but does not purify the metals from injurious mixtures and combinations. Of this process Bloxam, in his work on metals, says: 'Since, however, this treatment does not effect the removal of the sulphur and phosphorus from the metal, it is not able to produce good bar iron from any but the best qualities of pig, such as are considered too expensive for its conversion into bar.' This shows that while the prophesy of the writer may be practicable, Bessemer has not yet attained it.

"During the past winter I have been operating almost entirely upon iron, in the largest malleable iron works in the country, having exclusive charge of its laboratory, and during that time have made a great many experiments to reach this point, bringing all my practical knowledge of chemistry and metallurgy to bear upon it. In the course of those experiments I discovered a cheap process of purification for removing foreign mixtures from the iron and restoring it to the state of nature. The metal by this process can be run into hot wrought-iron molds, and while hot, placed directly under the rollers and made into bars; or it can be cast into any form and annealed with much less expense than is employed in the present process, with a saving of time, fuel and labor, furnishing an iron that can be hammered, welded and drawn without becoming brittle, and possessing superior tensile strength. And this iron can be made from the commoner kind of pig, or, without cooling after leaving the smelter until it is cast into form, can be made direct from the ores.

"I have specimens of the iron made by this process, which those interested can examine, and as soon as the proper patents can be procured, I shall be ready to make arrangements to put in works."

THE FUTURE OF IRON.—A well-known French steel maker, discussing the future of iron, recently made the following remarks, which deserve some attention, as representing the views of a practical man on this subject: "Those who are occupied in the manufacture of Bessemer steel know how difficult it is to obtain with regularity the extra soft steel employed for boilers in the French navy. Such metal appears only to be made in the Martin furnace, and even then it is necessary to employ picked material in its manufacture. But by the new Bessemer dephosphorizing (Thomas Gilchrist) process, steel of an extraordinary degree of softness can be obtained with the greatest facility, and at a price less than that of ordinary steel. By heating a pig containing from 1.5 % to 2 % of manganese we obtain, after the decarbonization and dephosphorization is finished, a non-oxidized metal, which does not contain more than a trace of carbon or manganese. If it is desired that the steel should be entirely free from any tendency to red-shortness, we may add from .25 % to .50 % of a rich ferromanganese to remove any traces of oxygenization. The only precaution to be taken to obtain a soft steel is to choose pig (if direct working be employed) which contains sufficient manganese (with 2 % as a maximum), or to make a suitable mixture of pigs, if cupolas be employed. But this will be by no means the one outlet for dephosphorized metal, for up to the present time the high price of soft steel has been the great obstacle which has prevented many people from employing it in construction. But by this process soft metal can be produced at a less price than ordinary (puddled) iron; there is, therefore, no longer any reason (apart from routine), why steel should not be employed in all cases in place of iron, to which it is so much superior in strength."

TESTING BEARING METALS.—After buying bearing metals, some machine builders go to the trouble to have a test made of their coolness of running, thinking that when they do this they are doing all that is needed to be done. This test for cool running is made by making a shell of each of the several samples to be tested, one against another, and putting this shell upon the journal, running the journal at a very high speed and under considerable pressure, until the heat of friction boils the water, or heats it to a certain observed temperature. Such a test can be of little or no use in determining the anti-friction qualities or the wearing qualities of a bearing. A bearing may run cold and yet consume a great deal of power and wear away very fast; it may wear long and yet consume power and run hot; or it may wear long and wear hot and consume power. These three elements exist in different proportions in different bearings. It is not always necessary to have all of them in a very high degree. In ordering or mixing a bearing metal, the proportions and character of the material should be determined by the diameter and length to be given to the journals, the speed they are to run at, the load they are to bear, etc.—*Am. Inventor.*

SCIENTIFIC PROGRESS.

A New Accumulator.

Since the Faure accumulator, otherwise Plante's improved secondary battery, saw the light of day, save the *Electrician*, numerous patents have been taken out by not less numerous inventors, and we may expect all the electrical firms or companies to shortly have each its own accumulator.

For some time past, indeed, periodical announcements have been made respecting some new accumulators which were said to give wonderful results and leave far behind them the now well-known Faure apparatus. These announcements, for some unknown reasons, persisting in existing on paper only—caused at last the people interested in the success of the Faure accumulator to wake from their lethargy and write in a short but well-meant letter what they thought of that kind of anonymous announcements; their theory upon the subject being of the same nature as that of the naval secretary who thus expressed himself on one occasion in Parliament: "Men," said he, "disputed, and perhaps would ever dispute, as to the best type of battle ships; but a good ship that was armed and afloat was better than an ideal ship which was still on the stocks."

But still another great improvement in electric storage or accumulation batteries was again announced about a month ago, which is said to be possessed of five times the durability and two and a quarter times the storage capacity of the Faure accumulators. The following advantages are also claimed in favor of the new apparatus: To be of such a practical construction that they can be readily renovated when necessary, without waste of material; to cost less than the Faure accumulator to manufacture; to be of great electrical capacity, each cell of about .43 of a cubic foot in size, and consisting of about 60 lbs. of metallic materials; is capable of containing about 400 amperes, and of delivering during eight hours a current of 50; each cell is said to represent over one-horse power of energy for one hour.

In this particular instance we are promised more than mere assertion, as the new accumulator has been patented in this country, and will soon be put into practical use by an electric light company.

A SECRET TELEPHONE.—The National Secret Telephone Co. recently filed articles of incorporation in Albany, N. Y.; capital $5,000,000, with power to increase it to $10,000,000. The route of the line is from New York to Albany, thence to Buffalo, with the right and privilege to extend the route to other States and Territories. The company, which has not yet been fully organized, was incorporated to manufacture and put in operation a telephone invented by Prof. J. Harris Rogers, of Washington. It is called the "secret telephone," because when two persons are talking no one else, although he may be on the same line, can listen to the conversation. The inventor claims great advantages for his instrument over the ordinary telephone. Instead of being suspended, the electrodes float in mercury, which gives distinctness in sound and enables the telephone to be operated at long distances. There are many other minor differences between the "secret" and the common telephone, but the advantages urged are the secrecy and the superiority in transmission. In an experiment in Washington, conversation in a low tone at a distance of 25 ft. from the transmitter was heard plainly two and one-half miles away.

MELTING POINT OF FATS.—The method adopted by the "Society for the Mineral Oil Industry," in Halle, is to be preferred for the safest and most accurate results above all other methods. Instead of determining the melting point they use the solidifying point as a basis for their results. The following method is recommended as giving accurate results for the direct determination of the melting point: A cylinder having thin walls is heated in a beaker containing water or oil. In the cylinder there is a thermometer whose bulb is only partly dipped into the fat. The temperature is determined at the moment when the fat begins to become transparent.

RESTORING WORN COINS.—Recently, while Dr. A. H. Beet, of Savannah, Ga., was silver-plating a small article with silver cyanide solution, he used an old Spanish silver coin as anode. The coin was worn perfectly smooth and had been hammered to twice its original size; yet in a little while after it was put in the bath every letter and figure became plainly visible. The date, 1800, though defaced so as to be beyond deciphering with a powerful glass, became plain.

VARIATIONS IN THE VELOCITY OF SOUND.—Prof. Mach, of the University of Prague, has experimented with sounds which are produced by electric sparks. The waves which are excited by two simultaneous sparks interfere, and the interferences are observed by the traces which they leave upon glass covered with lamp-black. The velocity of wave propagation is greater than that of ordinary sound waves, but it diminishes in proportion as the waves separate from the point of excitement, and tends towards the ordinary values.

The Sun's Fuel.

What keeps the majestic ball hot and bright? This has greatly engaged physicists and astronomers, and various have been their theories. If the sun shone only by mere combustion of its own materials, the calculation is that its fire would not last 5,000 years. It is very kind of Dr. Siemens to come forward with an entirely new theory, which holds out the hope that the men of science are all wrong with their dismal foreboding, and that the creation is not schemed on the poor footing of a German stove or a suburban gas company. The learned ironmaster and physicist believes that the sun may very well go on illuminating and warming our world and the family of sister planets for an indefinite, if not infinite, time. He supposes interstellar space to be filled with an extremely attenuated hydrogen, and interplanetary space with denser gas, albeit more rarefied than the atmosphere drawn round each world. The sun, he thinks, whirling on its axis, draws into its poles the thin hydrogen, hydrocarbon and oxygen of our sphere, and these, being kindled, are projected outward at his equator into space. The accepted view is that the heat and light there developed and radiated perish, as far as we are concerned, except for the small portion arrested by each solar satellite; but Dr. Siemens argues that this heat and light do their chief work in decomposing the carbonic oxide and watery vapor which were produced by the kindling at the solar poles, so that the sun itself perpetually renews its own supplies, and restores by its energy the waste matter which has fed that energy. The theory is much too technical and complicated to be here discussed, and we should offer a bad compliment to its ingenious author even to attempt such a task. Dr. Siemens, however, has had great experience with the phenomena of radiated heat, and his applications of the new view to the nature of the zodiacal light and of comets is particularly striking. Of course it is startling to hear of something in our own system which closely resembles perpetual motion; and those who maintain that everything comes to an end, and that all mechanical energy must be gradually degraded and metamorphosed, will be slow to receive the new suggestion.—*London Telegraph.*

TORNADOES AND HOW TO AVOID THEM.—The Signal Service Bureau has in press a monograph, by Sergeant Finley, containing a review of the observations of 600 tornadoes, with generalizations from the recorded facts and suggestions as to the methods which ought to be followed in the investigation of such storms. The storm studies have occurred during the past 87 years in all parts of the country. The storms occur most frequently from five to six in the afternoon, although there is no hour of the day that has been entirely free from them. The average width of the path of destruction is 1,085 ft., and the storm cloud runs with a velocity of from 12 to 60 miles. The wind within the vortex sometimes attains a velocity of 800 miles an hour, the average velocity being 392 miles. Among the most valuable suggestions of the paper are those with reference to the peculiarity of the movements of tornado clouds, containing rules for arriving at their violence. A tornado cloud always has a center, and it always moves forward from west to east. It may, however, sway from side to side in its progressive movement. Changes in motion are sometimes very sudden. In the event of a sudden change the observer, who is east or south of east of the storm, should move quickly to the south. If he is northeast he should move to the north. If within a very short distance of the cloud the observer should run east, bearing to the south.

CANALS ON THE PLANET MARS.—A curious discovery, made by Signor Schiaparelli, Director of the Royal Observatory at Milan, seems to start again that old and unanswerable question, "Are the planets inhabited?" This Italian astronomer is one of the most assiduous watchers of the planet Mars. It was he who, in 1877-78, first detected the many dusky bands which traverse and subdivide the ruddy portions of the martial orb. Again, in 1879-80, when the position of the planet was favorable, he re-identified these strange lines; but during last January and February he has been able to observe and map out, in more than 20 instances, duplications of the dark streaks "covering the equatorial region of Mars with a mysterious network, to which there is nothing remotely analogous on the earth." The Italian astronomer has styled them "canals," for they bear the appearance of long seaways, dug through the martial continents, as if a mania for short cuts had seized the inhabitants of the planet, and everybody residing there had become an active M. de Lesseps.—*London Telegraph.*

INJURIOUS ELEMENTS OF ILLUMINATING GAS.—M. Pohek, of Breslau, finds that the chief poisonous agent in illuminating gas is carbonic oxide. In some cases, when the gas traverses a stratum of ground which is not yet saturated, it deposits the hydrocarbures which give it its characteristic odor and then diffuses itself in dwellings without its presence being perceived. In such cases the danger of explosion is added to that of poisoning. Explosions are comparatively rare, because the definite proportions which are required for an explosive mixture are not present. When the gas is imperfectly burnt, as in heating apparatus, there is an excess of moisture which is injurious to health.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Apr. 27		Week Ending May 4.		Week Ending May 11.		Week Ending May 18.	
Alpha	1.10	90c	1.15	1	10c	....	50c	....
Alta	2.55	2.05	2¼	1.95	1.90	1.45	1.55	85c
Andes	70c	60c	70c	65c	70c	60c	60c	40c
Albion	2.15	2.05	2.15	2.05	1.95	1¼	1.95	1½
Argenta	5c	....	....	....	10c	5c	15c	10c
Addenda	....	....	....	....	....	....	....	....
Belcher	60c	45c	55c	40c	40c	20c	45c	25c
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	5½	5½	5¼	5½	5½	5½	5¼	1.10
Bullion	20c	....	40c	20c	30c	....	30c	25c
Beehtel	25c	....	30c	....	30c	25c	30c	25c
Belle Isle	....	....	....	....	....	....	....	....
Bodie	6	5½	6⅝	5⅝	5¾	5¼	5¾	5¼
Benton	60c	50c	60c	50c	50c	45c	45c	35c
Bulwer	....	....	2½	2.20	....	....	2.10	....
Boston	30c	....	30c	20c	....	....	....	....
Back Hawk	....	....	10c	....	....	....	....	....
Bodie Tunnel	....	....	....	....	....	....	1.20	....
Booker	....	....	....	....	....	....	....	....
Caledonia	....	....	....	....	....	....	....	....
California	10c	5c	30c	25c	25c	20c	25c	15c
Challenge	25c	....	25c	20c	....	....	55c	....
Chollar	85c	75c	85c	75c	60c	45c	55c	25c
Confidence	80c	75c	80c	....	80c	70c	70c	65c
Con Imperial	....	....	....	....	....	....	....	....
Con Virginia	70c	60c	70c	62½	65c	6 c	60c	40c
Crown Point	65c	60c	70c	65c	60c	50c	55c	40c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1.80	1½	1½	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	1½	1.60	1.50	1.65	1.90	1.70	1½	1.30
E. Mt. Diablo	10c	....	10c	....	10c	....	10c	....
Eureka Con	24	22½	22⅝	21½	21½	21	19½	19
Eureka Tunnel	....	....	....	....	....	....	75c	60c
Exchequer	30c	25c	25c	....	25c	....	20c	10c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	....	....	15c	5c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	40c	....	50c	45c	35c	....	25c	....
Gould & Curry	3.05	2.70	2.85	2.35	2.35	2.20	2.40	1.50
Hale & Norcross	1.60	1.40	1.55	1.30	1.30	1.10	1.35	60c
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	15c	....	....	....	....	....	....	....
Julia	15c	....	....	....	10c	....	10c	....
Justice	55c	45c	55c	40c	40c	30c	35c	25c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	25c	....	40c	....	25c	....	25c	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Lewisthan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1½	....	1½	....	1½	....	....	....
Martin White	4½	....	4	....	4.30	4.05	3.90	3½
McClinton	....	....	....	....	....	....	....	....
Mono	1½	1½	1.60	1.35	1½	1.20	1.30	1.10
Mexican	9½	7½	8½	7½	7½	6½	6½	4.95
Mt. Diablo	4	3½	4	4	4.10	3.85	3.80	3.60
Mt. Potosi	....	....	....	....	....	....	60c	5c
Noonday	1½	90c	1.05	1	1	90c	1	90c
New York	15c	....	....	....	....	....	5c	....
Northern Belle	7½	7½	8	....	8	7½	6½	4½
North Noonday	1	....	1	90c	1	95c	1	95c
Navajo	1.30	1.15	1.55	1.35	1.60	1.45	2	1.80
Occidental	1	....	95c	....	....	....	50c	....
Ophir	4.60	3½	4½	3.70	3½	3½	3.35	2.55
Original Keystone	....	....	....	....	....	....	....	....
Overman	25c	20c	25c	10c	15c	10c	15c	10c
Oro	35c	30c	30c	25c	25c	....	20c	15c
Paris	....	....	....	....	....	....	....	....
Potosi	80c	65c	70c	50c	35c	25c	75c	25c
Pinal	....	....	....	....	....	....	2½	2½
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.60	1½	1.55	1½	1.65	1.10	2.10	80c
Seg Belcher	2.30	2	2½	....	....	....	5	....
Sierra Nevada	9½	6⅝	9⅝	8½	8½	6⅝	6½	5
Silver Hill	....	....	....	....	10c	....	....	....
Silver King	17	....	17⅜	17½	18½	18	18	17
Snecor	....	....	....	....	....	....	....	....
Summit	20c	....	....	....	....	....	....	....
Scorpion	1	80c	1	85c	60c	70c	80c	60c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	25c	....
South Nevada	....	....	....	....	....	....	7½	6⅝
Syndicate	30c	20c	....	....	....	....	....	....
Tioga Con	20c	....	25c	....	....	....	15c	....
Tiptop	4	....	....	....	3½	....	3.20	3
Tuscarora	....	....	....	....	....	....	....	....
Union Con	15½	12⅜	14½	12	12½	10½	10⅞	8½
Utah	5⅝	4.65	5	4⅜	3	2.40	2.65	2
Ward	3½	....	....	....	3½	....	....	....
Wales	55c	45c	50c	....	50c	....	....	....
Yellow Jacket	1½	1	1½	1.15	1	90c	95c	60c

Sales at S. F. Stock Exchange.

Thursday A. M., May 18.

450	Alta	155	Utah 2@2.05
50	Alpha 50c	1225	Union 8½@9½
169	Andes 40@45c	305	Yellow Jacket 60c
300	B & Belcher 1.15@1.10		AFTERNOON SESSION.
350	Bullion 25c	600	Albion 1.60
50	Benton 35c	400	Bodie 5½@5¾
200	California 15c	150	Bay 1½
50	Chollar 35c	20	Eureka Con 18½
100	Confidence 65@70c	520	Eureka Tunnel 50c
890	Con Virginia 45@40c	700	Goodshaw 15@20c
350	Crown Point 45c	1000	Grand Prize 5c
70	Exchequer 10c	150	Mt Potosi 5c
330	Gould & Curry 1.70@1.65	40	Mono 1.15
690	Hale & Nor 70c	200	M White 3½
200	Julia 10c	80	Northern Belle 6¾
370	Justice 20@25c	50	Navajo 1.95
550	Mexican 5@4.95	1030	Noonday 1
280	Ophir 2.55@2.60	100	Oro 10c
430	Overman 10c	20	Pinal 2
1370	Potosi 60@55c	70	Southern Nev 6¾
755	Savage 80@90c	65	Silver King 17½
915	Sierra Nevada 5@5¼	100	Tioga Con 15c
100	Scorpion 70c	50	Tiptop 3

Bullion Shipments.

We qnote shipments since our last, and shall he pleased to receive further reports:

Eureka Con., May 6th, $15,868; Christy (for Apri), $27,343; Christy, May 12th, $5,935; Betty O'Neal, 11th, $5,089; Contention, 9th, $13,418; Enreka Con., 8th, $9,446; Union Con. (for April), $94,052; Contention, 29th, $19,484; Northern Belle, 30th, $8,200; Standard, 30th, $17,707; Union, May 4th, $42 252; Contention, 1st, $11,688; Bodie Tnnnel, 17th, $3,790; Contention, Con., 13th, $15,851; Alice, 9th, $24,000; Germania, 9th, $2,490; Stormont, 9th, $3,450; Tintic, 9th, $953; Copper Belt, 9th, $427; Pioche, 9th, $805; Horn Silver, 10th, $25,000; Bullionville, 10th, $1,462; Horn Silver, 12th, $12,500; Hananer, 13th, $2,150; Germania, 13th, $1,260; Bullionville, 13th, $1,700; Tintic, 13th, $1,400; Horn Silver, 14th, $20,000; Barhee & Walker, 14th, $1,437; Stormont, 14th, $3,300; Germania, 14th, $2,330.

THE Boston and Montana Gold Miuing Company paid a dividend of 10 cents per share, or $20,000, at New York, on the 5th, making a total of $280,000 to date.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	No.	AMT.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Alpha Con M Co	Nevada	16	50	Mar 20	Apr 26	May 19	Wm Willis	309 Montgomery st
Argenta M & M Co	Nevada	10	10	Apr 12	May 19	June 12	E M Hall	327 Pine st
Alta S M Co	Nevada	23	50	May 2	June 6	June 27	W H Watson	302 Montgomery st
Belcher S M Co	Nevada	30	25	Apr 14	May 17	June 5	J Crockett	327 Pine st
Belmont M Co	Nevada	31	15	Mar 11	Apr 17	May 15	J W Pew	310 Pine st
Belvidere M Co	California	13	25	Feb 9	Apr 12	June 8	C V D Hubbard	310 Pine st
Best & Belcher M Co	Nevada	23	50	Apr 5	May 11	June 2	Wm Willis	309 Montgomery st
Bullion M & M Co	Nevada	23	30	Mar 29	May 2	May 24	J M Brazell	328 Montgomery st
California M Co	Nevada	3	20	Mar 29	May 6	June 5	G P Gordon	309 Montgomery st
Chollar M Co	Nevada	6	25	May 9	June 12	June 30	W E Dean	309 Montgomery st
Excelsior Grav M Co	California	16	25	May 4	June 6	June 23	D B Chisholm	327 Pine st
Fair Vil's M Co	Arizona	1	2½	Apr 24	May 29	June 19	J H Sayre	330 Pine st
Goodshaw M Co	California	10	10	Mar 21	Apr 22	May 18	C C Harvey	309 Montgomery st
Martin White M Co	Nevada	12	25	May 9	June 10	July 20	J J Scoville	309 Montgomery st
Napoleon M Co	Csifornia	8	5	Apr 20	May 22	June 8	H Smith	307 Montgomery st
Navajo M Co	Nevada	10	20	Mar 7	Apr 27	May 22	J W Pew	310 Pine st
New Coso M Co	California	13	10	Mar 30	May 1	May 22	D B Chisholm	327 Pine st
Niagara G & S M Co	Nevada	6	20	Apr 1	May 3	May 25	O C Miller	401 Montgomery st
Overman M Co	Nevada	53	25	May 1	June 6	June 27	G D Edwards	414 California st
Pinal Con M Co	Arizona	3	30	Apr 3	May 6	May 29	W W Traylor	309 Montgomery st
Potosi M & M Co	Nevada	8	50	Apr 12	May 16	June 6	W E Dean	309 Montgomery st
Quartz Moutain M Co	California	14	75	Mar 16	Apr 24	June 24	E Hestres	729 Montgomery st
Savage M Co	Nevada	51	50	May 4	June 6	June 26	E B Holmes	309 Montgomery st
San Pedro G & S M Co	Nevada	5	10	May 10	June 12	July 10	W G Holmes	Sherman's Building
Sierra Nevada M Co	Nevada	73	1 00	May 17	June 21	July 10	E L Parker	309 Montgomery st
Silver Lick Con M Co	Nevada	1	05	Mar 29	May 6	May 27	L J O'Farrell	Montgomery Block
Silver Belt M Co	Arizona	1	15	Mar 8	Apr 17	May 15	J W Pew	310 Pine st
Silver Hill Q M Co	California	2	25	Apr 12	June 10	July 10	J W Pew	310 Pine st
Star M & M Co	Nevada	10	10	Mar 22	Apr 22	May 15	Wm Stuart	320 Sansome st
Tellurium G & S M Co	California	26	10	Apr 1	May 3	May 24	H P Bush	431 California st
Union Con S M Co	Nevada	19	1 00	Mar 21	Apr 25	May 15	J M Buffington	309 Montgomery st
Villagrana M Co	Lower California	1	20	Apr 25	June 26	July 15	A Judson	320 Sansome st
Utah S M Co	Nevada	29	1 00	May 4	June 10	June 29	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Arizona-Utah M Co	Arizona	2	01	Mar 7	Apr 21	May 12	N C Carnall	320 Sansome st
Caledonia M & M Co	Nevada	12	25	Apr 5	May 18	June 15	W Letts Olliver	323 Montgomery st
Golden Fleece Grav M Co	California	25	30 00	Apr 15	May 20	June 8	F Schirmier	725 Folsom st
Grand Prize M Co	Nevada	8	10	May 2	June 5	June 26	E M Hall	327 Pine st
Holmes M Co	——	4	10	Apr 4	May 8	May 29	E A Holmes	318 Pine st
Lima Con M Co		1	05	Mar 31	May 5	May 31	R D Hopkins	436 Montgomery st
Monumental Tunnel M Co	California	2	05	Mar 31	May 3	May 22	D B Chisholm	327 Pine st
Santa Annita M & M Co	California	3	03	Apr 17	May 22	June 12	J M Buffington	309 California st
South Bodie M Co	California	6	15	Mar 27	May 2	May 25	Henry Dess	309 Montgomery st
South Hite G M Co	California	4	10	May 3	June 5	June 26	F A Berlin	420 Montgomery st
Tower Con M Co	Nevada	1	10	Apr 7	May 12	June 1	G W Sessions	309 Montgomery st
Wide Awake P & M Co	Arizona	10	10	Mar 17	Apr 29	May 25	C Hilderbrandte	cor Bush & Kearny
Western Home M Co	——	3	05	Apr 10	May 11	June 15	A Halsey	323 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Con Amador-Volcano H & G Co	Cal	G D Newhall	16 Montgomery Avenue	Annual	May 24
Excelsior Grav M Co	California	D B Chisholm	327 Pine st	Annual	June 6
McElroy Grav M Co	California	L Lillie	607 Washington st	Annual	June 6
Silver Hill M Co	California	W E Dean	309 Montgomery st	Annual	May 29
Tilden M Co	——	C Van Dyck Hubbard	310 Pine st	Annus	June 6

LATEST DIVIDENDS—WITHIN THREE MONTHS

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	May 12
Contention M Co	——	D O Bates	309 Montgomery st	25	Feb 28
Eureka Con M Co	Nevada	W W Traylor	309 Montgom ry st	50	Apr 27
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Apr 17
Silver King M Co	Arizona	J Nash	315 California st	25	Apr 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	May 12

The Mining Share Market.

The mining share market continues dull, with limited transactions and slight fluctnations. Down at Bodie the Noonday and North Noonday joint incline is now getting down to a point where water may he enconntered at any moment, its depth being 253 ft. below the 512 level. When water shall have been reached, a crosscut east of 35 or 40 ft. will intersect the ledge, where the interest of Bodie district is now very largely centered. Those who saw the ore in the winze 200 ft. helow the 512 level are most sanguine that a rich development will he made in this lower working.

On the Comstock as yet no movement has been made toward the drainage of the flooded mines. The Yellow Jacket folks are ready at any moment to set their pumps in motion, hnt the other companies concerned do not appear to have made even the first move toward standing in with them.

At the sonth end the Alta folks now have the whole lead to themselves and are doing some excellent work in the way of exploring the conntry at the depth of 2,150 ft. Other companies in that section are standing back, waiting to see what the Alta people will find.

The *Enterprise* says: On the 2600 level of Union the northeast drift is still cutting streaks of low-grade ore. It is liahle now at any time to run into paying ore. The winze (No. 1) helow this level continnes in streaks of good ore, the largest of which are two feet in width. The hottom of this winze is liable to he wholly in ore almost any day.

At the Savage they will soen begin exploring, with drill and crosscnt, their 2400 level from points on the main north drift. On the 2200 level the main north drift is now entering very interesting ground, and has ahout reached the point where the first great flood of water hroke into the mine some years ago. As to what was to be seen at this point there was great curiosity at the time. The edge of this curiosity is somewhat dulled hy the rust of time, as regards the multitude, yet mining men are still interested in the matter, even thongh nothing of valne shall he fonnd. A careful examination of the rock formation at the point may serve to show whence come the heavy flows of water it is not desirahle to cut into. Many are of the opinion—or were at the time—that the flood ponred out of a large seam or channel between the west conntry rock and the vein material lying against it. Recent work in the north drift on the level wonld seem to indicate that there is a heavy hody of quartz, or, at least, vein matter, where the west conntry rock was snpposed to lie.

THE Morning Star mine at Leadville has been under its present management six months, and dnring that interval it has pnid seven dividends of $25,000 each, and has a snrplus of $80,000.

THERE are recorded in Summit mining district, which inolndes Butte, 4 000 locations, the entire area heing shout as large as Bodie district. There are three smelters, one concentrator (Colorado patent), two 60 stamp dry crnshing mills, and another nearing completion of like capacity, helonging to the Lexington company, owned and officered hy French and Italian capitalists, who recently purchased it from Judge Davis, Jr., for $1,000,000 and 200,000 shares of the stock.

THE nnnnal meeting of the Evening Star of Leadville was held at New York on the 1st of May. This mine has been in operation for three years. Dnring that period the expenses at New York were $7,000; at Leadville—inclnding developments, etc.—$393,000, making a total of $400,000. The product was $1,500,000, leaving a net profit of $1,100,000. Out of this snm 43 dividends of $1,075,000 have been paid.

SWEETWATER.—The Summers mill is shut down for the present, while a new hoiler and two new pans are being pnt in. It will take till Jnne 1st to complete these improvements. The mine is said to he looking hetter than ever, which report is confirmed hy tho fact that the owners are projecting,a new tunnel 300 ft. helow the old one.—*Esmeralda Herald.*

THE amount of ore for sale, represented hy sample hottles assayed hy Frank Foote yesterday, was 1,090,650 pounds. It was all from Bingham, and domonstrates that the old camp is coming to the front again as one of the greatest mining camps on the Coast —*Salt Lake Tribune*

THE Copper Qneen mine was sold as a prospect for $4,500, and subsequently for $18 000. After the mine had been developed and a smelter erected, the property sold for $1,200,000. It has since paid $300,000 in dividends. The last dividend was paid on the 1st of April.

THE Portage Lake, Mich., copper mines produced 7,364 tons of copper in the first qnarter this year—an increase of 639 tons over the same time last year.

THE rush of teams and men to the Oregon Short Line in Idaho still continues, and the Utah & Northern is taxed to carry them as fast as they arrive at Ogden.

THE first ore shipments from Wood river this spring were made hy the Minnie Moore. The ore is very rich, and there is ahont 500 tons mere on the dump awaiting transportation.

THE Nevada *Transcript* sensibly suggests a miners' convention, so that the qnestion at issue hetween the ranchers and the miners may be fairly presented to the people.

W. E. WILD, the superintendent of construction of the Princess mill, has arrived, and will at once hegin getting together the material for the fonndation.—*Candelaria True Fissure.*

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

ISABELLE.—*Monitor-Argus*, May 15: The Exchequer mill started up last week, after several days' stoppage, on Stella ore, and everything works like a charm about the mill and new furnaces.

ONION.—The Orion G. & S. M. Co. has erected a residence and boarding house near its claim on Stella, and work will soon he commenced in the mine.

COPPER.—Extract from a letter from J. O. Stewart, Esq., concerning copper produced from Stella ore at the Exchequer mill: "Alameda, May 1, 1882.—Your last shipment of copper did all of us credit. Holden told me today that it went 78.¾ copper, and only 3¾ moisture."

AMADOR.

GIANT.—Amador *Ledger* May 13: This quartz claim is owned by Messrs. Reaves & Way, and is located a mile south of Plymouth. There is a shaft down 40 ft, with hunches of quartz varying in widtb from 4 or 5 to 15 ft. The owners are working the property on a small scale by the arastra process, crushing about 3 tons per day. How the rock pays is not definitely known, as no tborough clean-up has been made. Enough is known, however, to warrant the belief thst it will more than pay expenses by regular mill process.

BUTTE.

HUPP'S RED GRAVEL MINING CLAIM.—Oroville *Mercury*, May 12: Among the many valuable mines of Butte county is John Hupp's red gravel hydraulic claim of 160 acres, held under patent from the United States Government. This claim was located in 1871, and purchased by the present owner in 1872, who bas worked it, when water was obtainable, ever since. A ditch having a capacity of from 600 to 700 inches has been constructed from the mine to Middle Butte creek, which supplies water for a few months each year, sufficient for hydraulicing. For a length of 80 ft an exposure bas been made along the gravel deposit showing a depth of from 80 to 125 ft of paying gravel. A good dump of a perpendicular hight of near 500 ft enables the impounding of tailings, which are carefully stored for future washings—the bottom stratum being so hard as to require exposure to air, which slakes it and frees the gold carried off in the lumps which unavoidably go off at the first time of washing. The past season but 32 days' water was had, which never exceeded in volume more than 400 inches, and the owner cleaned up from the flumes $1 700. He employed about 5 men. A large proportion of the gold yet remains in the pit, on the bedrock, that having not yet been cleaned up, while at the second washing of the impounded tailings the yield is often as much as the first. Mr. Hupp was in town the fore part of the week and exhibited to us a nugget of 2 ounces weight which he recently picked up in the claim. He has refused an offer of $64,000 for the mine.

CALAVERAS.

TAPPING OLD WORKS.—*Mountain Echo*, May 10: On Friday evening last, while two Chinamen were drifting in the McElroy mine, on Bald hill, at a depth of about 200 ft, they, by some means tapped the old works, and a heavy volume of water rushed into the drift, which was about 700 ft from the main shaft. The Chinamen ran to the shaft and were hoisted out just in time, as a minute more would have been fatal to them. The mine rapidly filled with water, but is being pumped out, and work will be resumed again.

CAVE.—While Keys & Fletcher were at work on Monday last, cleaning out an old drift in their mine, a terrible cave occurred, literally filling the mine with debris. A few minutes before the cave they had been in the drift some distance examining it, as to the probability of its being a safe place to work. Being satisfied on that point, Mr. Fletcher went to the surface and sent Geo. Lindsay down to fill tubs; George had no sooner reached the bottom than he discovered that the mine was caving. He and Keys then got in the tub and were rapidly hoisted to the top, thus luckily escaping a free burial.

LINDSAY & CO. are pushing work on their mine as fast as possible. The tunnel has been run into the hill over 20 ft and is large and roomy, being 4x6 in the clear. It will require about 300 ft of tunnel to reach the old works. More than likely, however, good pay will be found soon. This is one of the most valuable mines in the county.

A NEW vein has recently been discovered in the Black Oak mine which yields from 50 cents to $2 per pan, and bids fair to become a permanent lead.

EL DORADO.

STRIKE.—Georgetown *Gazette*, May 13: Another strike of some $3 000 has been made this week in this vicinity, but we are forbidden to give any further particulars this week. J. C. Rich, superintendent of the Pease & Blair hydraulic mines on Long canyon, was in town Thursday. He says that work started up on the 1st inst., and that an abundance of water is assured for the entire season. Mr. Bowers and party, who have been running a tunnel to tap the lode in the old Graves mine, at Volcanoville, for the past 6 months, reached the lode this week, which is highly satisfactory. Thus another 10 stamp mill will be added to that camp this summer. Corwin & Spencer continue to take out big pay from their claim east of town. Ike Tankeley has made a strike on mine near town, but the amount is not known at this writing. We learn that the Cal. W. & M. Co. are going to lay pipes from the upper ditch to furnish the town with water this summer. We have it from good authority that the owners of the Eureka mine, in this place, are negotiating with parties in this State for the placing of a large mill upon the mine.

GREENWOOD.—Our "important mining camp" can at the present furnish but few mining items. Our mines generally are in a state of repose. Our citizens have turned their attention to bucolic pursuits, and our mining town is now a cow corral. The music of the (cow) bells on the hills by day, and on the streets by day and night, is never ceasing, interspersed by the nocturnal mariars of our numerous fences, the bowls of our canines, and the bleating of calves and goats, etc. Mr. Desmarchias is working as usual in the Nagler mine, and some work is being done on the Union and Spanish mines, and I believe on the Muntz and Niagara hydraulic mines, beyond which all is quiet. Capital has been invested in our mines; the season for activity in mining is here, and I suppose in due time a commencement will be made, and probably the Middle fork of the American river will be a center of attraction this summer. Mr. J. A. Meudes, of Pilot hill, writes me that he is driving a tunnel to his quartz mine on Pilot hill for the purpose of developing. This is a move in the right direction. Mr. Mendes has, I believe, valuable mining properties, and his claim on Pilot hill will prove a rich and lasting mine, and be the means of attracting attention to the many very promising but neglected quartz lodes in that neighborhood. The want of a quartz mill has long kept that district back, but the day is coming when it will become a busy quartz mining locality.

MONO.

NOTES.—*Homer Mining Index*, May 13: New mines are being discovered daily in the Sweetwater region..... Mining will be resumed in Prescott district the present season.....Prospectors are striking out into the mountains in all directions.....Work will probably be resumed on the Gold Band mine next week.....Arrangements are now being made for bringing in the Little Emma 10-stamp mill.....A very rich strike in the Detroit company's copper mine in Jordan district is reported.....The west crosscut, 150 level of the Bay Queen, is being steadily pushed in favorable ground.....Work is still being prosecuted on the Garfield, and the rich ore vein holds its own as the cut is advanced.....The shaft of the Josephine is being substantially timbered, and sinking will be resumed early next week.

MARIPOSA.

BAD MANAGEMENT.—Mariposa *Herald*, May 12: The managers of the Bentoo Mills tunnel seem to have managed their prospecting very poorly when they drove through very rich rock somswhere in the mine and knew nothing about it, as now the richest kind of rock is found in the dump. A fair specimen, found by Thomas McElligott, can be seen at Schlageter's hotel, which shows coarse gold in large quantities. This rock would assay many hundred dollars per ton. The question naturally arises: This rock came out of the tunnel, the tunnel is yet open, why can't they prospect along on the vein and find this rich chute? But when we learn that many shafts have been sunk, crosscuts, over cuts, etc., run, the timbers have been taken out and the said works allowed to cave in, excepting the main tunnel, then we know it would be next thing to an impossibility to tell exactly where it did come from.

NEVADA.

GOLD FLAT EUREKA.—Nevada *Herald*, May 10: A *Herald* reporter visited the above mine yesterday afternoon, in company with W. G. Richards, E. M. Preston and John Bonney. The Eureka is situated on Gold flat, a few hundred yards southeast of the once-famous Sneath & Clay mine. Upon our arrival at the mine we found a gang of men at work getting everything ready to put in place the hoisting and pumping machinery recently purchased. The main building is nearly completed. It is about 50x20 ft in size. In addition to this a boiler room and blacksmith shop will be built on. The engine is 10-horse power, and a 6 inch pump will be used to handle the water encountered in sinking the shaft. The new incline is now down about 80 ft. ft will have to be sunk 50 ft further before reaching the level of the old works. It is a 2-compartment shaft, substantially timbered and has thus far been easily sunk, no blasting being required. The ledge will probably be tapped when the shaft reaches the level of the old works, if not before. It is expected that steam will be got up next Saturday. Everything about the new hoisting works is being put up in a substantial manner, and indicates that the stockholders have great faith in the future of the mine. The work is being ably superintended by Mr. John Trenberth, the efficient superintendent. A short time since a crushing of 40 tons of ore from the Eureka paid over $120 per ton. The calculation is that the money thus obtained will pay the cost of the works now being put up. We wish the stockholders success in their undertakings, and trust that before long one of the richest gold mines in Nevada county will be opened up through their enterprise and exertions.

NEW YORK HILL.—*Tidings*, May 15: Work is still being pushed ahead at the New York Hill, with the very best prospects before the miners. About the same number of men is now employed as there was last year. Late developments in the mine show a great improvement over those of two months ago.

THE Empire is looking exceedingly well, the 13 level being especially good. The mill is running night and day on good ore.

THE Ontario Co., whose works are located on the Colfax road, have their shaft down 80 ft, and are now crosscutting for the ledge. Indications are very favorable. There is scarcely any water to contend with at the Ontario. The mine is managed by Messrs. Richardson and McDriff.

THE Champion mine, near Nevada City, is looking very well. A slate formation has recently been encountered and a strong and permanent ledge, in all probability, will soon be reached.

THE Lowrie ground is being diligently prospected. A new tunnel is being run a few ft south of the old one. This new tunnel will tap a vein of gravel which was discovered in the old one, but which could not be worked from it. Tributers and contractors are constantly working on the top of the hill on ledges which this tunnel is destined to tap. The ground is known as the old Marshal property, in the south part of the town of Grass Valley.

THE Imperial Co. is driving its shaft ahead, and will continue so doing until water level is reached. This excellent little prospect has just taken out a crushing of 4 loads, which will be milled as soon as it can be hauled. On Thursday last some gold bearing quartz was taken from the Imperial.

DRIFTING is still going in at the Washington. The ledge is looking better and is widening out. There is considerable water to contend with in the mine.

THE old Morning Star gravel claim, at Iowa Hill, in Placer county, as we learn from a gentleman who knows all about it, is being diligently worked by the company and they have the very best prospects ahead. The Morning Star claim has been worked for a number of years, and good success has attended the efforts of the company. At the start it was worked by drifting, then the hydraulic process was resorted to, but the cement proved to be too hard for this mode of work, and now the company is again drifting. A tunnel has been run and an upraise made which has reached good pay gravel. A 10 stamp mill has just been completed and will soon start to work crushing the cement and gravel. John C. and Edward Coleman, of Grass Valley, and J. H. Neff, of Auburn, are the principal owners.

PLUMAS.

A PROMISING MINE.—Plumas *National*, May 12: We have been informed by several parties lately that the quartz ledge discovered near Squirrel creek, Mohawk, last year, and known as the Roberts mine, is showing some splendid prospects. ft is being opened by Gallagher & Co., who have run a tunnel to the ledge and drifted each way, besides sinking a shaft. The ledge shows good rock and is extensive, being some 4 or 5 ft wide. Some of the experienced quartz men of the Plumas-Eureka say that it is the best quartz prospect in the county. It should be thoroughly developed during the present summer.

PLUMAS-EUREKA.—This old and well known mine is keeping on in the even tenor of its way and proving a "stand-by," as usual. Mr. Keddie, who was recently at work there, informs us that everything looks very prosperous, and that good ore is being opened up in the level below the Mohawk tunnel. The Eureka tunnel, on a level with the Mohawk mill, near Johnsville, is now in a distance of 2,2 0 ft. When completed it will tap the pay ore at a much greater depth than has heretofore been reached, and the company will then have the advantage of coming down out of the deep snow.

KILLED IN THE EUREKA MINE.—On Friday of last week a sad accident occurred in the Eureka mine, resulting in the death of a young man named James Knotwell. He was at work in one of the shafts with 5 other men. Some timbers were being let down, and a large piece, 14 ft in length, got out of the skip and fell to the bottom, striking Knotwell on top of the shoulder, killing him instantly.

SIERRA.

MORRISTOWN.—*Mountain Messenger*, May 13: Work is in full blast at Morristown and Craig's flat. About 50 men are being worked and a great many more would be put on if they could be obtained.

SCALES.—J. Dibson, who is over this week, reports times lively at this old mining camp. Union Hill gravel claim, owned by Boyce, McChesney & Westall, is yielding handsome returns this season. Thus far about $14,000 has been realized. Abundance of water to last until the 1st of August. Twenty-five men are employed. The same number are employed at Fair Play, Boyce & Bro. owners. No clean-up there yet, and will not be for some time, but working on good ground. Diggings at Poverty hill in full blast, and will pay well this season.

KILLED.—A Chinaman employed in a mining claim near Scales' diggings recently got into a flume, was carried over the dump and was found dead on the bank below.

COUNCIL HILL.—The mining claims at Council Hill, owned by Boyce, Westall and others, are paying better this year than ever before. We understand that the company has already cleaned up $14,000 from a short run.

CONTRACT LET.—*Tribune*, May 12: N. H. Noble and other owners of the Rainbow mine, at Chipp's Flat, have contracted with Walter, Lind & Co., of San Francisco, for a 10-stamp mill to be erected at the mine as soon as possible. This mine has been steadily developed for the past 3 years, during which time a large amount of money has been extracted. There is now ore enough in sight to warrant the erection of a mill. The new mill will have power sufficient to permit the setting up of 10 additional stamps should it be necessary.

MINING SALE.—The Rainbow M. Co. has purchased of S. S. Crafts, of Alleghany, the Twenty-one mine, located on Kanaka creek. The amount paid for the property, we understand, was $3,000. In connection with the mine was a water right which was necessary for the company to have, in view of its building a water-power mill on the creek.

TUOLUMNE.

OUR MINES LOOKING UP.—*Independent*, May 13: A number of the Tuolumne mines are looking up. The Heslep mine at Quartz mountain has come upon fine-looking ore in the 800 level. The Little Gem, on the Mother lead, owned by W. N. Harris, is opening up splendid ore; also the Alabama, adjoining. The 40 stamps at the mill are kept busy by the miners, who quarry from the vein from the surface down, in large quantities. The Soulsby mine, at the lower level, is also extracting rich ore, and our informant says the mine has not looked better for years. Divoll is still taking out large quantities of gold in his bonanza claim at the upper end of town. The past week the men in the drifts came upon a large body of gold to the south, showing that the gold in this immense vein is not confined to one locality. Capt. Colby, on this bonanza vein, north, is again in fortune. About 100 ft on the hill above the present incline shaft some boys who were prospecting on the surface found some beautiful specimens. Mr. Colby investigated the "find," and for the past week has been doing a business that a 40-ton would be proud of. The Patterson mine, near Tuttletown, has a large force of men at work, employed by an English company. They intend to sink several hundred feet on the vein and put the properly in good shape. As the spring opens a lively interest is being taken in mining. We need new blood in this business for legitimate work, and less jobbing, as has heretofore been the case. We are in possession of many curious, interesting and crooked facts regarding our Tuolumne mines, showing that our "properties" are not faulty in many of the cases of failure.

TRINITY.

BRIGHT PROSPECTS.—Trinity *Journal*, May 13: From parties who have recently visited the mines of the Nash Deep Gravel M. Co. on Coffee creek, we learn that the prospects are excellent and that the company will make a splendid showing this season. They are said to have lately struck one of the richest gravel deposits ever found in the county. Work on the new ditch and other improvements is progressing favorably.

NEVADA.

WASHOE DISTRICT.

CHOLLAR-NORCROSS-SAVAGE SHAFT.—*Enterprise*, May 12: Sinking the shaft is being pushed ahead vigorously. During the 7 days ending yesterday at 12 M., 25 ft have been sunk and timbered, making the total depth 2,490 ft.

CALIFORNIA.—Joint Con. Virginia east drift, No. 2, on the 2700 level, has been advanced 21 ft, and are now putting in a drain. On the same level the main south lateral drift has been extended 20 ft.

UNION CON.—On the 2500 level are stoping out ore. The northeast drift on the 2600 level has been advanced 18 ft, and No. 1 winze on the same level has been sunk 13 ft. On the 2700 level east crosscut No. 1 has been advanced 50 ft. On the 2900 level the joint Sierra Nevada west crosscut has been advanced 25 ft. During the week 517 tons of ore have been extracted from the stopes on the 2500 level, and 520 tons and 1,220 lbs. have been sent to the mill.

SIERRA NEVADA.—On the 2500 level No. 2 winze has been sunk and timbered 11 ft. The main north lateral drift has been extended 30 ft. The air course with No. 2 north drift is completed.

ALTA.—During the week the flow of water on the 2150 level has greatly increased, and it requires the pump, running at 8½ strokes a minute, and one bailing tank, going constantly, to handle it. The 2150 station has been covered several times during the past few days, owing to the temporary stoppage of the pump. The west drift on the 2150 level made 45 ft last week, and is now out 1,281 ft. The crosscut near the Benton line on this level is out 11 ft. The formation in the face is encouraging.

YELLOW JACKET.—During the past week the water rose 7 ft, standing to day 413 ft above our 2300 level station. At the Winter's shaft we commenced to-day opening the old sagebrush station on the 100 level from the surface. The 400 level drift is in 50 ft, having been run 35 ft during the week. In the 640 level drift we made 26 ft, the face of the same to-day being 36 ft from the station. We have reopened the 1028 level station and repaired 40 ft of the drift.

MEXICAN.—On the 2700 level are cutting a drain in the main lateral drift; also, are cutting out for west crosscut No. 2.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, May 13: The main drift on the fifth shaft level has been extended 21 ft during the week in the same formation as reported last week. The face of it is 115 ft distant from the station. The other shaft levels present about the same appearance as last week. The adit and levels above, though showing no material change, look fully as well as at time of last report, and are yielding the usual quantity of ore. The daily output of ore is about 50 tons. Mill No. 1 has finished crushing Mount Diablo ore, and will be shut down for the present. Owing to the caving of the main line shanter shafting in mill No. 2, the same has been entirely stopped since the accident. The new piece of shafting, ordered to replace the broken one, was expected on the 10th inst., and on its being in place operations at the mill will be immediately resumed. Meanwhile there will be no bullion shipments, but as the usual amount of ore is being delivered at the mill, there will be a large surplus on hand when crushing is resumed. Besides the broken shaft, some other very much needed repairs have been made to the mill.

MOUNT DIABLO.—Winze No. 1 has reached a depth of 98 ft, making a total depth of 106 ft below this third level, and shows a ledge of low-grade quartz in the bottom that looks more favorable. The east drift from winze No. 2 is in 18 ft, and is still showing a ledge of low-grade ore. Winzes Nos. 3 and 4 show no change. The latter is now down 97 ft. The east drift on the second level has advanced 12 ft, and the north crosscut near the face of this drift is in 21 ft. The south crosscut near the center of the mine, on the same level, is in 33 ft, and has shown encouraging streaks of ore for several days. The south crosscut from the east drift on the first level is in 82 ft, and has a more favorable formation in the face. Two shipments of bullion were made since last report, one on the 6th inst., amounting to $8,437.64, and one on the 9th inst. of $10,598.65.

EUREKA DISTRICT.

EUREKA TUNNEL.—Ruby Hill *News*, May 15: We visited the Eureka tunnel Thursday, and were shown through the long bore by foreman Motte. The breast, he informs us, is directly under the northeast corner of the Silver Conner ground, and 1,972 ft from the mouth. It is expected that work will soon be resumed in the header, and the tunnel continued. The new shaft being sunk about 150 ft from the south winze is now down 12 ft, and is being steadily pushed downward. It will be sunk about 100 ft, in order to connect by drift with the winze. The object of the new shaft is to give a working shaft through which the ore can be hoisted without the necessity of double windlassing, and also to prospect the ground. It is also designed to connect the tunnel, by means of a drift near the shaft, with the shaft of the El Dorado, a distance of about 500 ft. The El Dorado shaft is now down about 130 ft, and will have to be sunk to a depth of 250 ft to strike the tunnel level. By this connection much good ground will be prospected and good ventilation secured for both mines. Work on the drift from the winze is being pushed, although the foul air sometimes interferes. Contracts have been let for driving the tunnel and drifts. Work was begun to-day.

ESMERALDA DISTRICT.

HUMBOLDT HILL MINING COMPANY.—Esmeralda *Herald*, May 13: Ore enough to keep 2 eight-horse teams constantly employed is being extracted and shipped to the mill. The mill is still running along without interruption, and a constant flow of gold and silver running out. As no clean-up will be made until the first of the month, we are unable to say how much the ore is paying, but we are told that it will yield a fair profit to the company. It looks good to see the large ore teams making regular tripe through our streets.

LEWIS DISTRICT.

BETTY O'NEAL.—Lewis *Herald*, May 10: The ore from the Betty O'Neal mine is still being hauled by Case's team to the Eagle mill, and the quantity on the dumps does not appear to decrease. The stopes in the mine look first rate, and there is plenty of rich ore in sight. Bullion will be shipped every other day in future. A new sinking pump has been shipped from San Francisco, and is daily expected, together with the necessary column-pipe. The pump is a 4-inch discharge, and of the latest and most improved pattern. As soon as it can be got in place deepening the shaft will be pushed ahead. The prospects of the Betty O'Neal are very flattering.

MORNING STAR.—The contractors have not yet finished the sinking of the Morgan incline on the Morning Star mine. The ore extracted is of good quality, and the ledge still retains its size.

EMMA.—The contractors on the Emma mine have cut the ledge in the lower tunnel, and some pieces of rich ore have been taken out. The ledge is large and of good looking quartz, but from appearances the tunnel is north of the ore chimney in the old shaft.

EAGLE.—The Eagle tunnel is still being pushed ahead as rapidly as possible through the country rock under the foot wall of the ledge. Crosscuts will be made through to the hanging wall, probably next week, or soon after the arrival of Manager Bothwell.

MT. COREY DISTRICT.

BIG INDIAN.—S. L. Hunk, one of the owners of the Big Indian mine, is in Virginia City. He said to a *Chronicle* reporter that the Mt. Corey district is prosperous, over 50 men being at work. Considerable prospecting is going on. The ore in the principal claims is free-milling gold, but recently some discoveries of silver ledges have been reported. The Big Indian mill is being kept going constantly. Five more stamps are soon to be added to the mill.

SANTA FE DISTRICT.

TIP TOP MINE.—Virginia *Enterprise*: The Tip Top mine, Santa Fe district, Esmeralda county, owned by B. G. Smith & Bros., and under the management of Johnny Powell, is the best developed mine in the district. There is a force of 12 men at work. Recently a very important development was made on the 250 level, an 8 ft vein of $100 ore being cut at that point. The work at present is merely prospecting and developing, no ore being extracted except where veins are cut in doing the necessary work. The Tip Top is without doubt a large and valuable property. In the Dunbarton mountains, in this district, some big copper mines have recently been discovered. They are running as high as 40%.

TUSCARORA DISTRICT.

OUTLOOK.—Elko *Independent*, May 16: The outlook at the various leading mines is more satisfactory than could reasonably have been anticipated, recent unexpected developments giving positive assurance of lively times this season, at least. The new discovery in the Central has been prospected westward 100 ft and to the east 150 ft, disclosing at a depth of 13 ft a 7-ft ledge, an average of the ore across its entire face giving an assay of $100 to the ton. Samples of the high-grade ore from the lead, shown us, would assay nearer $1,000. In the Argenta explorations are reported as being very satisfactory, and in the Navajo the ore developments are said to exceed anything heretofore uncovered in that mine.

ARIZONA.

GLOBE DISTRICT.—*Chronicle*, May 6: In the McMorris the vein has been cut on the 600 level, showing soft ledge matter, rich in silver, with superb promise. The shaft on the La Plata Richmond basin, is 40 ft below the tunnel, and about 120 ft below the surface. Indications are splendid. Next week will give approximate value of ore dump.

OLD DOMINION PROPERTIES.—The smelters of the Old Dominion copper continue turning out bullion at a rate astonishing experienced reducers of copper ores. The fact is, the ore is extraordinarily rich in not only copper, but gold and silver. The developments in the mines justify the most sanguine expectations. The Indian war has interfered seriously with transportation, but in spite of every obstacle, the energetic superintendent has kept his works going almost constantly, and has reason to be proud of his output. Whether the Old Dominion mine should be called a gold or copper mine is a matter of doubt. The present workings show up a richness of gold production which would pay were the copper thrown away; and, we might say, vice versa—throw the gold away and the copper will pay. All eyes are turned upon the properties of this company just now, with a confidence that it will be "the making" of this city and district.

COLORADO.

ENGINES.—*Register-Call*, May 5: Mr. Whitaker, of the King M. Co., Nevada district, has purchased Leidyerwood engines of the capacity of 20-horse power and 30-horse power boiler which will be placed over the working shaft of the King lode.

ORE.—The owners of the Vancouver mine, on Camp Clifford mountain, are very jubilant over the fact of having struck a good body of ore in their main shaft. The vein matter is of unusual width, and contains quite a large amount of clear mineral. The ore is assorted in 3 different qualities, the refuse or waste being piled up for concentration.

DILBERT & CO., discoverers and owners of the Yellow Jacket, north of the Vancouver, have everything in readiness to start up the workings of the vein. ft is quite likely that a plant of machinery will soon be placed over the mine.

THE CLIFFORD MINE, operated through the management of Mr. J. E. Rockwell, of the city, has a large lot of concentration ore out and piled up. The recent strike in the lower last level is largely adding to the output of the mine. Modifications in the arrangement of the manipulation of the ore treated under stamps are being made. Mr. Rockwell informs the *Register-Call* that an Embry table will be used in connection with the Bradford tables.

W. D. YOUNG & CO. are drifting east from the bottom of the main shaft of the Jenny Lind lode, situate near the head of Woodpecker gulch, north of Camp Clifford. The shaft was sunk through a lean portion of ground, but in drifting east under the mountain, in going but a short distance, they have struck a fair sized pocket of silver-bearing ore—galena intermixed with gray copper and zinc blende.

THURMOND & HAMILTON, of the Russell dry ore concentration works, have received their new and improved fan, which has been placed in the mill building. It works like a charm

IDAHO.

WEST FORK MINES.—Wood River *Times*, May 10: A prospector, who recently took a run through the West Fork mines and prospects, reports enough ore in sight and on the dumps to keep the Philadelphia Co.'s smelter running all summer. The Dutario and Star, of the Rook's group, have large bodies of ore in sight, and many tons on the dumps. The Philadelphia Co.'s mines, the Blackhawk and the Irvine group, are looking well. The latter were recently purchased by the company for $40,000 cash. There are 300 tons of good ore on the Blackhawk dump. The Nignthawk, an extension of the Blackhawk, owned by Connor, McGregor & McLeod, is also looking well. The winter's development work has shown it to be a good property. The Allen group was prospected during the winter by shafts and drifts on several ledges. One shaft is down 55 ft, the bottom in ore. The Rogers, one of the group, has been prospected by open cuts for a distance of 500 ft, showing ore at every opening. Snow is fast disappearing, and West Fork will soon be open for prospectors up as far as Little Smokey divide.

ONE MILLION IN SIGHT. Miners just down from Vienna state that there is $1,000,000 in sight in the Solace mine, at that place. The tunnel reached the vein 333 ft from the entrance, cut it 81 ft west of the discovery, at a depth of 170 ft to 200 ft below the surface. The vein is about 15 ft wide, with 2 pay streaks—one on the hanging wall, 10 inches wide, of $50 rock; the other on the foot wall, 6 to 15 inches wide, of high-grade ore.

BLOW-IN THE SMELTER.—It is reported that Col. Lewis, of Ketchum, came down to Hailey yesterday to make arrangements with Falk & Co., to work his Elkhorn ore, but that no one could be authorized to make contracts. Several parties are offering ore for sale, and making inquiries as to when the smelter will be blown-in.

BAYHORSE ITEMS.—Idaho *Messenger*, May 12: Men are at work shoveling snow and repairing the trail from Ramshorn and Skylark. Good ore has been struck in the Tenderfoot mine. We hear blasting every day on the Bullion. Captain W. A. Gill is satisfied there is a body of ore there. We hope he may strike it. There are many new arrivals here but there are more than can obtain employment at present.

WOOD RIVER ITEMS.—*Miner*, May 6: New strikes are being made now daily and we predict that before the next 60 days have passed more valuable finds will be made within 7 miles of this place than at any other point on the river. Work done at mining within a radius of a few miles, during the past winter, has been a paying operation in every instance, one of the number netting nearly $30,000 with less than half a dozen men employed. Many new prospects, within a few weeks and inside of 5 miles of town, have been found and located. The location of Dickson & Pinkham is considered equal, if not the best of any. Mr. Burgess, of San Jose, found an immense body of galena ore on Saturday last and many other prospects are reported daily now. Many of our people are making preparations for going to their mines for work. A. Himes and partners are at their East Fork claims. I. I. Lewis is preparing for extensive work on the Elkhorn, Webster and Conners for the Trail Creek canyon mines and many others on the canyon. Parties will soon be on Lake Creek; J. Miller and partners, who will arrive soon, will operate on Eagle creek; Mr. Chambers and others on North Fork; and the 47 locations on Boulder creek, mostly owned by Shultz, McMillan and Murdock Bros., will also be worked. The Warm Springs M. Co. will soon have a new superintendent at the mines who will have authority to push their mining operations to the fullest capacity. They will probably erect smelting works during the summer. Hundreds of other claims on Warm Springs creek will be fully worked the coming season. The new find of ore by Adams and Hughes excites much attention, owing to its richness and the large quantity of ore in sight. The Connors and Chambers claims near the Philadelphia Co.'s property will produce large amounts of first-class ore with very little work. The Allen and Dement claims are showing finely and will have a number of tons of ore to sell at once. Col. Miller, of Philadelphia, the new superintendent of the Philadelphia M. Co. appears to be the right man in the right place.

SQUAW CREEK.—*World*, May 10: Prospectors are beginning to turn their toes in the direction of Squaw creek. About 20 are now there, and a good many more will strike out for that district shortly.

MONTANA.

CLEAR GRIT.—*Inter-Mountain*, May 11: On the Clear Grit the west 120 ft drift on the foot-wall vein has been driven 100 ft, the ore body being remarkably regular and uniformly rich. The stopes will soon be opened. The sinking of the main incline has been vigorously prosecuted and the 260 station has been completed. A crosscut from the bottom of the shaft is being driven south to tap the hanging-wall vein which in the upper level is both rich and extensive.

THE SHAKESPEARE-PARROT is being actively developed under the supervision of Alex. Tarbot. The main shaft has attained a depth of 200 ft and crosscutting out to the ledge is now progressing. Several weeks will elapse ere the ore body will be tapped, as the distance to run is considerable. From the upper workings a little first class ore and a considerable amount of second-class ore are being extracted. The latter is shipped to the concentrator, which is running very satisfactorily.

NEW MEXICO.

GEORGETOWN ITEMS.—*New Southwest*, May 6: Some very extensive pockets have recently been struck on the second level (18 and 20 ft below the first series of pockets) on the Naiad Queen, which bid fair to produce ore in large quantities. The mine continues to turn out its quota of ore, and there is scarcely a doubt but that large pockets exist throughout the entire depth of the silurian lime, which extends down for several hundred ft on the lower side of the contact. The main shaft on the Nalad Queen is upwards of 400 ft in depth, showing good ore, in places as much as several ft in width, on the contact between the lime and the porphyry. The intention is to go through the lime. The McGregor and Commercial mines are being extensively worked, not only by the owners, but also by lessees, all of whom are doing well, judging by the amount of high-grade ore they are shipping to the mill daily. They have not the advantage of steam hoisting machinery on these mines, yet the horse whims are kept going pretty steadily extracting metal and waste.

OREGON.

NOTES.—Gregon *Sentinel*, May 10: Silas Draper, of Foot's creek, was in town Monday. He predicts a larger clean-up in that camp than there has been for many years. .....Mr. Benner, of the Centennial mine, made a very satisfactory clean-up last week. There is still a fair supply of water in the Willow Springs camp.....Work at the Sterling hydraulic is being crowded day and night with a full head and no interruptions.....Mr. Stoutsmeister, of San Francisco, is across the Siskiyou examining the Emeline quicksilver mine for San Francisco capitalists, with a view to bonding or purchasing....Good work is being done at the Squaw Lake mine and a considerable amount of dirt is being washed.....The Green Bros. are still stoping splendid rock from the Sugar Pine ledge, in Josephine county, and have a large amount of it in sight. The mine is now well opened and a handsome stake is assured to these patient miners.....The big strike in the Walt Simmons mine lately opened on Galice creek is much talked of in Josephine county. It is said to be the richest ground in that county and the clean-up will be immense.

UTAH.

EXCITEMENT.—Southern Utah *Times*, May 13: The excitement in and about Copper Gulch is unabated, and the whole country is located by excited prospectors.

SINKING THE SHAFT on the South Horn still continues as rapidly as possible. The ore which was struck in this mine some few days since still continues to improve as depth is attained. Supt. Cody is a man of large experience and one of the best miners on this coast. The prospects for his striking ore in this mine are certainly very flattering, and he will undoubtedly have a second Horn Silver mine before long.

LEVEL.—The work of drifting on the 400 level of the Lulu still continues without interruption. This drift is now in considerably over 100 ft and is expected to cut the ledge inside of the next 100 ft if it does not pinch much deeper than it does in the Horn Silver mine. The formation is the same trachite which was encountered in drifting from the working shaft of the Horn Silver to the various levels. Mr. Pat. Ryan, a man of experience and pluck, is superintendent, and he will go on with the work until he succeeds.

Ill-fated Finders—Noted Discoverers of Pacific Coast Mining Camps.

The superstitious belief is an old one with the early inhabitants of Pacific coast mining towns, that unless the discoverer of a camp meets an untimely or bloody end, the place of his creation will not descend into the future as one of the "excitements." This idea seems to be not without foundation, wherever it originated. Of 38 "booming" towns in the early days, the locators of 12 were killed by the bullet, one caved into a deep shaft, and a majority of the others adrifted with the tide of emigration into oblivion, or died and were buried in panpers' graves. "Old Virginny," who donated an everlasting name to that queen of mining camps, Virginia City, came to his death by an "over" dose from a bucking mule, near Dayton, Nev., and the no less noted Comstock died by a bullet self-administered in Montana, and like his predecessor, he died financially broke. Colonel Storey, whose name that county adopted, was killed in battle by the Pyramid Lake Indians. Billy Farrell, who "struck" Meadow Lake, died a victim to remorse in one of the leading hospitals of San Francisco, haunted by the spirits of 1,000 delnded pioneers and prospectors passing and repassing at the foot of his bed. He made no confession, His name is a household word. His grave lies side by side with that of Doughnut Bill in the Lone Mountain cemetery, where he was planted in 1868. The locator of the first find in Pioche is said to have stopped a stage-load of shotgun messengers early in the Black Hills excitement, and rumor says that he was buried alongside a boulder not far from the line of the road. Kelse Austin, whose name is attached to one of Nevada's pioneer towns, is anchored in northeastern Elko county, and is probably no nearer the goldeu goal than the legion of early settlers who surround him. Of they who first uncovered "the lead in the White Pine mines" the world knows little. A lone grave under a whitepine tree tells a chapter in the tale. Of Eureka's first inhahitant nothing also is told us, hut it is safe to surmise that few nuggets weighed down his hlankets as he walked out over the grade. Tuscarora was the work of an insane emigrant from Massachusetts. Legend locates his tombstone near the adohs shacks of the old townsite, hut those posted, infer that he atoned for his misdeed by sinking himself to the hottom of the head waters of the Owyhee, if, indeed, he did not fall into the hands of a determined vigilance committee. Anrora started a goodly-sized graveyard with her "oldest inhahitant." Bill Body slept himself "away" in a snowstorm a few miles from the present place of writing. When his memory had reached the age of 20 years, his hones were resurrected and after heing paraded at the head of a procession of tenderfeet through the town after his own name they were identified hy his comrades and buried with imposing ceremony among the "had men from Bodie." A monument was raised to his memory, and it still stands unpaid for in the stone-cutter's yard. Homer, of Homer district, followed in the suicidal tracks of Comstock, and after squandering a small fortune shot his hrains out in the streets of San Francisco. These are hut a few of many instances, but the fates that have hefallen the many who have ventured in the discovery of new lodes, and succeeded, hear the old timers out in the helief that still has existence in not a few minds.—*Bodie Free Press.*

A Mexican Mining Legend.—One of the most commonly believed Mexican tales is that one of the "Step Devil." The men tell you in some of the mines there is a dwarf. A peculiarity about him is that he has immense long arms—so long that he can take off his sandals without stooping. This dwarf, when there is any danger in the mine, such as a cave, goes up the ladders, lifting himself hy his arms, with his legs hanging free. As he passes each rung he stamps or kicks it out of the side pieces, so that the men, when they attempt to fly, find all means of climhing out of the mine is destroyed. In the very old mines, which were worked hy the Indians, there were no ladders, hnt in their place trunks of trees, in which notches had been cut, and the Indians climhed hy inserting the hig toe in the notches. When the Indians tell you of the "Step Devil," they say that he has on each big toe an enormous nail, and that as he climhs the tree trunk he uses this to gouge the notches ont hy splitting off the part on which the toe rests. The story is evidently an Indian one, although altered hy the Mexicans to suit the change in the means of going up and down the shafts.

Reduction Works.—We have it from pretty good authority that the prospect for having reduction works here in Prescott, before long, is encouraging. The agents of a certain mining company are figuring on the matter, and, though little is said hy them on the subject, we know they mean business. It may he that Prescott will he asked to help the enterprise along. If so, something will, nndouhtedly, he done hy our people. The erection of one set of works would soon be followed by another, and although Prescott may never become as great a bullion extractor as Leadville, with her 12 or 14 reduction works and furnaces, producing over $3 000,000 every month, she will surely rank pretty high.—*Prescott Courier.*

Some Sonora Mines.

The Arispe District Coming to the Front.

Mr. A. W. Miller, of Sinoquipe, Sonora, is paying Tombstone a visit, and was taken in charge hy an *Epitaph* reporter yesterday afternoon and subjected to the news pump. Mr. Miller, in company with A. C. Riordan, his business partner, went to Sonora about five years ago and located at the town of Sinoquipe, in the Sonora valley, about 150 miles from the American frontier. They purchased some mines, and with characteristic pluck began to develop them. It needed no ordinary courage to stick and prosecute the work, as the mines were far from favorable at the start. But time proved the wisdom of their enterprise, and about a year ago the reward came. The San Augustine mine, on which most of the unproductive labor of years had been expended, snddenly revealed a bonanza. A good thing is never slow in asserting itself, and the San Augustine almost immediately jumped into public notice. Eastern capital sought a slice of the honanza, and something less than a half interest was sold hy the original owners for a large sum. A ten-stamp mill has been erected on the Sonora river near Sinoquipe, and will start up soon. Abont 150 tons of rich ore are at present on the dump, and the mine is opened up sufficiently to admit of ore being treated in large quantities. Several American and native lahorers are employed, and Mr. Miller has engaged the services of Archie McDonald and Charles Bigney, experienced mill men, to accompany him to Sonora when he returns. Los Delicias, the home of the famous Santa Helena mine, is situated a few miles south of Sinoquipe. The Santa Helena company has a ten-stamp mill in operation, and a large 60-stamp mill will be put in place this summer.

Messrs. Malter & Lind have entered into a contract with the Santa Maria Mining Co. to erect a 60-stamp mill, and work upon that establishment is now progressing. The Buena Fortuna mine, owned hy A. W. Miller, Geo. Marks, Mr. Fredericks and James Shane, is situated on the San Domingo, ahout half way between Arispe and Magdalena. The mines in the Arispe district are very extensive, and yield a fine quality of high-grade ore. Nearly all the discovered mines of any consequence are owned by Americans, either individual or corporate. The mountains in that vicinity swarm with the industrious prospector, and the day is not far distant when the American people will he in a majority. Both the government and the people invite and welcome American capital and labor. There is an abundance of timber and water in the vicinity, and the Sonora railroad is only distant about 60 miles. The mining companies and Malter & Lind, the contractors, have pooled their issues and will huild a good wagon road from Sinoquipe to the railroad. Mr. Miller thinks that the entire Sonora valley is naturally tributary to Tombstone, and that an effort on the part of our merchants would control the entire trade between here and Ures.—*Tombstone Epitaph.*

No Better Mining Country.—It is a strange thing that in mining undertakings capital should be so shy of investment in the development of our home mineral resources, while it is supplied without hesitation and lavishly for operations in wild and distant regions, difficult of access, and where the expense of carrying on enterprises are necessarily heavier, owing to these very conditions. But the conditions which it would seem should operate to discourage investment appear to have the opposite effect. Douhtless remote and comparatively unknown regions are hetter suited to the speculative class of mining, hut coming down to the legitimate industry is quite another thing. That there are good mines in those remote sections, in which capital can he invested with liheral compensation, there is no douht, hut why wander off in search of that which lies right at hand? The mineral helt extending through this section of country affords as good a field for remunerative mining enterprises as can he found anywhere, with hetter facilities for carrying them on.—*Calaveras Chronicle.*

Not a Success.—Last fall the Bear River Tunnel company out a bedrock tunnel through a spur of rock around which Bear river runs in the shape of a horseshoe, the tunnel heing 250 ft. long. It was the intention to cause the flow of the river to run through the tunnel and hy means of suitable undercurrents to catch the gold that is continually heing washed down the stream with the debris. The water was turned through the tunnel early in the winter, hut owing to the incapacity of the flume to carry all the water and wash during high water (the time when the most wash takes place), it has proved a failure—that is, the plan as practically carried out. We understand only about $8 have been cleaned up. The theory, in our judgment, is correct, hut practically the plan was a failure on account of the smallness of the tunnel. The company will not work the flume until after the tunnel has been sufficiently enlarged to admit the flow of the entire river.—*Placer Herald.*

Bishop Creek *Times:* From a private letter from Lone Pine we glean the following: Keynot has struck it rich, and every day rich developments are being made in Beveridge; Lone Pine is crowded with strangers; hotels all full and everybody happy.

Too Many Claims.

To show what a newly arrived prospector and miner thinks of mining matters in Arizona, we extract as follows from a communication signed "L. C." in the Globe *Chronicle:*

For two months I have done nothing else hut investigate the mineral resources around Prescott, and I can only say this much, that although the mountains and hills contain an unlimited amount of the precious metals, it is to he regretted that but a limited amount of development is carried on throughout this region. The reason for all this is, that the majority of the ledges or claims are for sale, and are not located for the sake of developing them. You will get an idea of some of the enterprising prospectors, when I tell yon that some of these gentlemen have or own from 17 to 31 ledges or claims, and have held them from one to 16 years. These same gentlemen claim that they do the necessary work on them every year, although these poor fellows have hardly any funds to purchase provisions to live on from day to day. Would you, or do you, or anybody else, helieve that these men perform the requisite work on these claims? It is the duty of the Territorial legislature to pass an act to stop all such foolery as taking up such numberless claims.

Another discouraging feature is the witnessing the large number of idle reduction works. Go where you will, and you will see reduction works of every description lying idle and going to ruin. Should you ask the question why the works are idle, the reply will he that the works are not able to extract the gold and silver in the ore profitably. This is all a mistaken idea. The fault lies in the incompetency of the parties who had the management of them. There are no ores here which cannot hs treated. But it requirss skill, or men who have been brought up in the profession. But every tom-fool of a pretender has had no difficulty in trying his wits on the ores in this direction. Is it to he wondered at that, when capitalists come hsre for the purpose of investing in minss, they go hack again on the same road they came, disgusted with the country and deterring others from coming here to invest their surplus money in good and reliable mines? This last state of affairs exists in the Globe district, as well as here.

The Californian for May.—The May issue of the *Californian* has a most excellent portrait of Longfellow from a recent photograph. Prof. Sill has, in the body of the magazine, an article on the dead poet that is at once discerning and appreciative. A profusely illustrated series of "Studies of the California Missions," by Frances F. Victor, is hsgun in this number. So much that is romantic and fascinating in the earlier history of California is connected with the missions, that these articles will prove of unusual intsrest. Pictures are given of the missions San Gabriel, San Luis Ohispo, Carmel, San Diego, San Buenaventura and San Juan Capistrano. That of the Carmel mission is a full-page sketch by the well-known artist William Keith. A character poem hy J. Rnssell Fisher is also accompanied hy a spirited engraving, "Only a Tramp." Amelia W. Trnesdell has a poem entitled "The Lost Jeannette," and there are numerous other articles of ahility, including several stories of marked power. James O'Meara tells the story of the celebrated Mier prisoners. Altogether this is one of the best issues of the *Californian*, and it should he duly appreciated.

Appropriation for California.—The House Committee agree to the following appropriations: For continuing the improvement of Oakland harhor, of $200,000. This amount is granted without any conditions such as have proved embarrassing in the last two appropriations for Oakland harhor. For the improvement of Humholdt bay, $40,000; for Wilmington harhor $75,000; for San Joaquin river $40,000; for Sacramento and Feather rivers $250,000. This amount is granted simply for the improvement and protection of the channels of the Sacramento and Feather rivers. The debris question, it will he observed, is not mentioned in the phraseology thus employed.

The *New Northwest* says: Instantly, on the discovery of gold in paying quantities, hetween the Yellowstone and the Missouri, and as a consequence of the prospect that the working of the Clarke's Fork mines, in the Crow reservation, would he legalized hy Congress, the shipment of mining machinery and tools over the Northern Pacific road hecame a new feature of its traffic. Large already, it will soon attain to first importance in the Northern Pacific company's westward traffic.

The Grass Valley *Tidings* says that Henry Nicholas has been working a stringer of quartz near his ranch, and the other day he run into a pocket which panned out $500 in gold. Some of the specimens of quartz gold were very hautiful and valuable.

The Winnemucca *Silver State* says: L. F. Dann has invented a concentrator, one of which is now running at the Eagle mine. A machine of 30 tons daily capacity can be huilt for $50, and it is said to work well and save all the gold and sulphnrets.

It is stated that the Richmond company has fair prospects of getting an ore hody on the ninth level, in close proximity to the Eureka Con. line.

Probate Confiscation.

The complaint is general, and not wholly without cause, that the estates of deceased psrsons are to a great extent absorhed in the costs and attorney fees attending their settlement. The father or the mother owning real estate dies intestate, leaving minor children, and, not only is it necessary that the estate of the deceased be probated, hnt the estate going under the operation of the law to the children must needs he kept in court through their entire minority, and often at such cost to the estate that little remains for distrihution.

As most psrsons know that this result can to a great extent be avoided by making a will, I suppose no one who reads this and has anything to devise expects to neglect this important duty; hutas he or she is not expecting to "shuffls off this mortal coil" just yet, the matter is likely to be postponed until too late. The title to the real estate is generally in the husband, who as generally neglects the matter of making a will, and the widowed wife is for years compelled to consult the probate judge as to how she shall educate and how clothe her children, and render consecutive accounts of every item of expenditure in their behalf, and pay large fees for the inestimahle privilege.

This is not according to the desire of the deceassd, hut rather the result of a pernicions custom and gross carelsssness.

The title to real estate acquired during marriage should, as a rule, be placed in the husband and the wife jointly, and each should make a will, leaving all of his or her property to the other and dispense with the necessity of any bond. Very few husbands and fathers desire, in case of their death, the nurtnre and edncation of their children placed in the hands, substantially, of others than the mother, and yet, as above indicated, this is generally the operation of the law as applied to the custom of putting the titles to real estate in the husband's name, and failing to invest the wife and mother with the titles hy will.

The following form of a will, sufficient for the purposes suggested, is submitted as simple, plain, and concise, and in the hope that it may induce many to act, who have hitherto been content with good intentions.

The last will and testament of ———— ————.

In the name of God, Amen.

I, ————, now residing at ————, do declare this to be my last will and testament: That, after the payment of my debts, if any, and funeral expenses, all my property and estate, of whatever sort or description and wheresoever situated, shall go and belong to my beloved husband (or wife, as the case may be) ———— ————, to have and to hold unto my said husband (wife) h— heirs and assigns forever. And I appoint my said husband (wife) to be executor of this my last will and testament, and request that —— be not required to give any bond as such executor, the necessity of security being given being hereby waived.

Witness my hand and seal this —— day of ————, 188-.

{ L. S. }

The foregoing was signed and sealed by the said ———— ————, in our presence, and we, in his (her) presence, at his (her) request, and in the presence of each other, sign hereto as witnesses,

———— ————.

———— ————.

—*Inter-Ocean.*

Comments.

Believing that some of our readers might be helped to record their wishes hy the above, we submitted it to our legal adviser for an opinion as to its character. He replies:

The article contains good advice and it is applicable here. However, if there is nothing hut community property, there is no need for the wife to make a will, for "upon the death of the wife, the entire community property without administration belongs to the surviving husband."—Civil Code, Sec. 1401.

Would make a single improvement in the form for the attestation of a will. The will given in "Probate Confiscation" is good, down to the attesting clause of the witnesses. There I would put this:

"The foregoing instrument was at the date thereof by the said ————, signed and sealed in our presence, and by him published as, and declared and acknowledged to us to be ls last will and testament, and we, at his request and in his presence and in the presence of each other have subscribed our names as witnesses thereto.

———— ————.

———— ————.

[Two witnesses, with their places of residence.]

Still a West to Which to Miorate.—This year a regular fever for migrating to new and wild regions appears to have broken ont in what was formerly the Western States. There is for many something romantic about thus setting out for unexplored lands. Even the old men and old women feel it, and at setting forth are filled with a new life and fire that makes them young again, while the young kick up their heels like so many haby colts. The rush is now into the far northwest, the Custer region heing a grand central point. Gen. Brishin, in a recent letter, dated Fort Keogh, Custer, Montana, speaking of this rush, says: "The cry is, still they come. I never saw such a rush of people westward. All trains are loaded down. The Ripon colony passed here yesterday—115 families, 506 souls—hound for Clark's Fork hottom. They had an immense train, and hring all their stock, horses, wagons, milch cows, plows, harrows, household furniture, tents and six months' provisions. They had a hand of music, an editor, a doctor, etc. They will tent out till fall, and huild their houses slowly. It seems to me it must be fun to come West in this way, when one has a jolly crowd and music."—*Virginia Enterprise, 5th.*

The Engineer.

The English Channel Tunnel.

We condense the following account of the present status of the great engineering feat of constructing a tunnel under the straits of Dover, to connect England with the continent by railway, from a late issue of the London (Eng.) *Building and Engineering Times*:

The total length of the 7-foot gallery, to test the practicability of a channel tunnel, now extends to upwards of a mile. Since this heading was commenced, the progress made has been of the most satisfactory character, and continues to improve. A uniform rate of boring is maintained, and the work is materially assisted from the fact that there is an entire absence of water. The debris from the heading is at present removed in trollies connected with the machinery at the top of the shaft, but in order to expedite the work a compressed air engine is about to be introduced into the cutting. A double set of rails is laid in the heading, so that no time may be lost in the conveyance of the trollies to and from the shaft. The gray chalk through which the 7-foot gallery is being driven is a very solid substance. As it comes away from the face of the heading it is in large flakes. The possession of a piece is regarded as a great novelty, and the miners find a ready market for any they happen to have. The boring is now proceeding under the sea.

It was recently announced in the House of Commons that the government had concluded to stop work on the tunnel until further action had been taken by Parliament in the matter. In regard to this opposition, which is based upon military grounds, the *Law Journal* observes that the Government will do well to consider whether the opposition of this country is necessarily conclusive. Suppose a French company, aided, it might be, by British capital, were to take French leave, and set to work without asking the British government or Parliament? It is clear that a tunnel might be ron from the French coast to the line at which British jurisdiction begins before any difficulty of international law would arise. From the limit of British jurisdiction to the shore, excavators would come within the influence of the rule that the sea within the limit is presumed to be in the possession of the country whose coast adjoins. But the Territorial Waters Act, 1878, applies only to jurisdiction on the sea, not to the land under the sea; and the rule as to the jurisdiction of the adjacent country cannot apply to land under the sea acquired by a foreigner from seawards.

The three-miles' rule assumes possession, being calculated according to the carrying powers of a cannon; and if there is any constructive possession of the land under the three miles of sea, it must give way to actual possession by a tunnel. In fact, from the point of view of international law, it would be the last step only which would cost—namely, the rise to the surface of the tunnel under the shore and in British *terra firma*. If, however, the French company could buy their footing, there is no reason why they should not hold it, as, by the Naturalization Act, 1870, the disability of aliens to hold land is abolished. No doubt an act of Parliament might be passed annulling the purchase; but such a step is more possible than practicable. It thus seems that, if England does not meet France half way, we may have France coming across to us under the sea and actually touching British soil at Dover.

FAST OCEAN STEAMING.—An old Scotch shipbuilder said, years ago, that if he were paid money enough he would build a steamer that would cross the Atlantic without breaking the Sabbath. At the time this was thought to be an idle boast. Twelve days between Liverpool and New York was then considered a fair passage, and 10 days was held to be a fast passage. But the confidence of the shipbuilder in the possibilities of the ocean steamer is justified by what is now being done every day on the North Atlantic. Although no steamer has yet made the passage within seven days, yet it is more than possible that that time will be made in the near future. The average time of the passage has been reduced until eight and nine days is only considered good time, and the extraordinary runs of the *Alaska*, of the Guion line, is an indication of a still further reduction. The *Alaska*, on her last trip from New York, made the run between Sandy Hook and Queenstown in 7 days, 6 hours and 53 minutes actual time, and she arrived at New York from Liverpool, on April 16th, having made the run from Roche's Point to the bar in 7 days, 6 hours and 18 minutes, averaging 394.83 knots per day, or 16.45 knots per hour. To give an idea of her actual work per day, we will state that on her first day she made 380 knots; second, 383; third, 392; fourth, 417; fifth, 409; sixth, 397; and seventh, 419.

MUSIC ON BRIDGES.—Bands of music are forbidden to play on most of the large iron bridges of the world. This is due to the well-known phenomenon that a constant succession of sound waves, especially such as come from the playing of a good band, will excite the wire vibrations. At first these vibrations are very slight, but they increase as the sound waves continue to come.

Useful Information.

Workmen in an Employer's Shop.

Every man in a workshop ought to constitute himself the guardian of his employer's property, and not only should he avoid waste himself, but, as far as practicable, he should discourage it in others. If this were done, millions of dollars would be saved to the country, a much larger percentage of profits would go into the pockets of the employer, manufacturers would be enriched, and, in the end, the workmen would be proportionately benefited. Strange that these simple facts should have so little weight; but so it is. Waste by another is cruel to the man who has to pay. It does not, can not, benefit the person guilty of it, and it is a dead loss to the nation. And every scrap of material so destroyed makes the product more costly, and consequently dearer. In the interest of workmen it is important that these facts be borne in mind. Wages bear a relative proportion to cost of raw materials, and both combined determine the price of commodities; the cheapness of this latter augments their sale, increases their production, enhances the demand for labor and tends to keep up wages; the reverse is equally true. If, therefore, an obvious duty is neglected or carelessly performed, the men mainly responsible ultimately suffer, and that suffering will be in an exact ratio to that which produced it.

One great remedy for the losses incurred by waste is a closer supervision of every detail of the undertaking, whatever it may be. This, however, involves extra expense. If the men can contribute to a saving in this respect, they will indirectly reap the advantage. To overlook this fact shows a lamentable ignorance of the internal economy of a workshop and of the forces and influences always at work for the purpose of bringing about a given result. And the men who complain of strict supervision are just those who need it most, and who, without it, would render large contracts next to impossible, for the simple reason that they would not pay, and could not therefore be executed. Many a builder and contractor has been ruined by the wastefulness of his employes and negligence of his foreman. A careful man is a jewel in a workshop.—*Builder and Wood Worker.*

NEW WINE-MAKING PROCESS.—Adolph Reihlen, of Stuttgart, has invented a process of wine-making, which, says the Vienna *Free Press*, opens a new era in wine industry, because it affords a means of thoroughly utilizing the grapes. An increase in the quantity of wine produced is attained without, as in the case of Petiot's and Dr. Gall's method, affecting its quality. Riehlen operates as follows: The berries are gently pressed, the must heated to boiling, and the marc mixed with the boiling must for three or four minutes, whereby the coloring matters, tartar, aroma, and other valuable substances are extracted, and at the same time the injurious albuminous substances are rendered insoluble. The marc is, however, not quite exhausted by this process, but is capable of imparting the rest of its still valuable contents to weak wines, so-called fruit wines, and saccharine liquids generally. By this method (which has been in operation since 1880), when purple grapes are worked up for wine, a deep bluish-red must is obtained in a few minutes without fermentation, the quantity of coloring matter extracted by the boiling must being from three to seven times as much as that extracted according to the old method after three months' fermentation. Reihlen further prepares the marc of purple grapes in such a way that even after years this will impart a color to red wines which have become bleached, or revive the taste of deteriorated wines. The process can be applied to both red and white wines, and the bouquet peculiar to the Reisling and Traminer grapes admits of being imparted to the must from other kinds of grapes.

THE FUTURE VALUE OF COPPER.—Soon we will not allow telegraph wires to be strung through our streets and over our buildings, to the detriment of life and property. And, when the time comes that telegraph wires must go under the ground, it will not pay to use any other metal for making them than copper, or steel, copper-coated. Even now, between our populous towns and cities, it is a question whether it would not be cheaper, in the long run, to string our telegraph poles with copper wires, or steel wires, copper-plated, owing to their greater durability and connectivity, just as railroads have found it more economical to use steel rails rather than iron. For conducting electricity for lighting, heating, and power purposes, copper wires must be used, and of considerable weight and thickness. It is said that Edison estimates that he alone will require 2,000,000 lbs. of copper in 1882. His is but one company. There are many other similar companies at work, not only in this city and country, but all over the civilized globe. The same activity prevails wherever there are energetic and civilized nations. As no man could foresee the extraordinary demand for iron that would grow out of the invention of the steam engine, so no man living can form a correct estimate of the demand for copper, for the coming time, that will be created by this more modern invention of the dynamotor.—*Mining Gazette.*

SAFETY SHIELD FOR CIRCULAR SAWS.—A new self-acting safety shield for circular saws, designed to guard against the constant danger which threatens the workmen, is made of a plate of iron or steel about as thick as the saw, and curved to its radius, broad enough to give sufficient firmness. It is placed at a given distance from the teeth of the saw, and is furnished with movable plates and adjustment slides, and screws to suit the alterations in the diameter of the saw by wear, or the substitution of smaller for larger saws, or stuff deeper than the cutting part of the saw. The shield is attached to an arm hung upon a stud concentric with the saw mandrel, and is balanced with a counterpoise under the table. The semi-circular shield is about one and a half inches deep and the same thickness as the saw. The forward end is so formed that the piece of timber to be cut raises the shield, but the latter rests upon the timber and forms a guard which prevents the workman from bringing his hands or arms into contact with the cutting edge of the saw. As soon as the timber has passed from the saw the shield returns to its original position, entirely covering the saw, and so remains until raised by the next piece of timber.

GRAPHITE AS A PAINT FOR SMOKE-STACKS.—John Dent of Ore Knob, Ashe county, N. C., writes to the *Engineering and Mining Journal* as follows: "I notice your suggestion as to the use of graphite as a paint to protect iron smoke-stacks against the corrosive action of sulphurous acid fumes. Two years ago I painted two iron smoke stacks with a mixture of oil and graphite, and it is now nearly as good as when it was put on. The stacks stand within 400 ft. of the roasting ore piles, and are exposed to the fumes for nearly half the time."

IMPROVED MORTAR.—Sawdust is better than hair in protecting rough cast from peeling and scaling under the influence of frost and weather. The sawdust should be first dried and then thoroughly sifted, in order to remove the coarser particles. A mixture is then made of two parts sawdust, five parts sharp sand and one part cement, which should be thoroughly stirred together and then incorporated with two parts lime.

AIRING FEATHER BEDS.—Do not put your pillows or feather-beds, if so unfortunate as to have feather-beds, into the sun to air, but in a shady place, with a dry wind blowing over them. If it is cloudy—but not yet damp—and the wind strong, it is all the better. This, if practiced often, will keep well-cured feathers always sweet. Badly-cured feathers cannot be made sweet. A hot sun on the best of feathers will turn them rancid.—*Mrs. Beecher.*

Good Health.

Flesh Worms on the Face.

The black points, flesh worms, technically termed comedones, which are found in the face, and especially near the nostrils, are not at all produced by the accumulation of the particles of dirt or dust, as has generally been believed, but by pigmentary matter, which is soluble in acid. It is known, in fact, that black comedones, which accompany and often appear, not only on persons exposed to dust, or rather careless of their person, but also on chlorotic young girls who live in good circumstances. Besides, observation shows that the discoloration not only exists on the surface of old comedones, but descends always to the lower parts. Accepting this fact, Unna has used successfully acids in the treatment of comedones. He generally prescribes: Kaolin, 4 parts; glycerine, 3 parts; acetic acid, 2 parts, with or without the addition of a small quantity of some ethereal oil. With this pomade he covers the parts affected in the evening, and if need he during the day. After several days all the comedones can be easily expressed, most of them even come out by washing the parts with pumistone soap. The same results can be obtained by bandaging the parts affected for a long time with vinegar, lemon juice, or diluted hydrocloric acid. The author concludes by saying that the acids act like cosmetics, as they transform the black color into a brown and yellow shade, and destroy it gradually altogether; they produce a quicker desquamation of the horny bed which interrupts the exit of the comedones and brings to the surface the glandular openings.—*Archives de Virchow.*

OUT-DOOR AIR AND EXERCISE.—The surest of all natural prophylactics is active exercise in the open air. Air is a part of our daily food and by far the most important part. A man can live on seven meals a week, and survive the warmest summer day with seven draughts of fresh water, but his gaseous nourishment has to be renewed at least 14,000 times in 24 hours. Every breath we draw is a draught of fresh oxygen, every emission of breath is an evacuation of gaseous excrements. The purity of our blood depends chiefly on the purity of the air we breathe, for in the laboratory of the lungs the atmospheric air is brought into contact at each respiration with the fluids of the venous and arterial systems, which absorb and circulate it through the whole body; in other words, if a man breathes the vitiated atmosphere of a factory all day and a close bedroom all night, his life-blood is tainted 14,000 times in the course of the 24 hours with foul vapors, dust and noxious exhalations. We need not wonder, then, that ill-ventilated dwellings aggregate the evils of so many diseases, nor that pure air should be almost a panacea. Out-door life is both a remedy and a preventative of all known disorders of the respiratory organs; consumption, in all but the last stage of the delirium, can be conquered by transferring the battle-ground from the sick room to the wilderness of the next mountain range.

The Assimilation of Fat.

Most physiological text books teach that the fat of the body is not derived directly from the fat of the food. But from statistical analysis Hoffmann has arrived at the conclusion that the formed fat of the animal body arises not only from heterologous elements of the food, but also in part, at least, from ingested fat. Radzejewsky concludes that the special destination of this fat is the intramuscular adipose tissue. A series of investigations, undertaken by Lebedeff in the clinical department of the Pathological Laboratory at Berlin, leads him also to the conclusion that the ingested fat is deposited unchanged in the fatty tissue of the body. Two dogs were kept fasting for a month, losing in the time about 40% of their weight. Previous experiments have shown that, under these circumstances, all the fat of the body disappears. The dogs were then fed on a diet which consisted of large quantities of fat foreign to their own nature, and a small quantity of flesh. Both dogs regained their normal weight in three weeks, and were then killed. One had been fed on linseed oil, and from its tissue was obtained more than a kilogram of fatty oil, which did not become solid at the freezing point of water, and which corresponded closely in chemical characters to linseed oil. The second dog was fed on mutton suet, which had a boiling point about 50° C., and in its body, in the muscles, about the internal organs, and beneath the skin, a form of fat was found which was almost identical with suet. The organs of each dog were free from disease. Thus it would appear that ingested fat, even such as is foreign to the individual constitution, may yet become transformed directly into the fatty tissue of the animal. Other experiments of the same investigator seem to show that this is true also of milk fat.—*Lancet.*

"HARDENING" THE BODY.—A young man was an earnest advocate of a theory that the human body can accommodate itself to any temperature in which it may be placed. One winter he determined to harden himself by wearing no covering for his ears; they were badly frozen on a very cold day, and were tender for several years after. He grew wise and abandoned the hardening process. A young woman heard an eloquent lecture on the importance of fresh air in chambers at night. The lecturer said there was no danger from a window slightly opened; the body would soon harden itself so as to resist the effect of the exposure. She tried the experiment one cold night and caught a severe cold, which lasted the entire winter. She lost faith in hardening against cold. A young mother maintained that children ought not to be brought up too tenderly. Arms and legs ought to be hardened by exposure in early years, and not be made tender by warm coverings in winter. She lost her two oldest children by croup and pneumonia, induced, as the physician said, by insufficient clothing. She gave up the attempt to harden the others. The best way to harden the body is to protect it well from extremes, both of cold and heat, and build up a strong constitution by good food, good sleep and good exercise. The Scotch Highlanders, with their bare legs, are victims to rheumatism.

THE BORACIC ACID TREATMENT OF DIPHTHERIA.—Dr. T. D. Harries, of Aberystwith, reports in the *Lancet* a very successful treatment of diphtheria by the local application of boracic acid in solution. The solution is prepared and applied as follows: Boracic acid, two drams; glycerine, half an ounce; water, half an ounce; to be applied freely to the fauces every hour at first, diminishing in frequency with the disappearance of the deposit and general symptoms. The application should be continued for some days after the throat has become perfectly clean. If discontinued too abruptly, the deposit is almost certain to reform, with a return of the general symptoms; and with the view of warding off this danger, I make it a rule to continue painting up to the eighth day, after which date the patient may be considered comparatively safe. The solution seems to have no injurious effect when swallowed, as I have frequently applied an ounce during 24 hours in the cases of children of from four to five years of age.

MOSQUITOES AS DISEASE CARRIERS.—The discovery that mosquitoes carry filaria in their probosces and infect the human subject with that much-dreaded worm parasite, has attracted considerable attention among English microscopists. Particulars of various cases are given, in which it is proved that those suffering from filaria had received the contagion from mosquitoes, and the latter have themselves been found infected with filaria. The latter are very minute worm-like parasites, which, on entering the human body, breed until they increase to countless numbers. They are also said to have the power of entering and leaving the body at pleasure—usually invading the circulation in the evening, increasing till midnight, and then retiring to other parts of the system.

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SAN FRANCISCO:

Saturday Morning, May 20, 1882.

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Patent Concentrator—F. A. Huntington, S. F., Cal.

Passing Events.

Hundreds and hundreds of men seem to be leaving the various camps where there is no special excitement and rushing to Idaho and to Montana. The Wood River region and Butte seem to be the main objective points. Information from both these places points to the conclusion that, while the country may be good for prospecting, it is a poor place for men to go in search of employment, as there are so many men there already. Our "Mining Summary," from week to week, gives the news from there and other localities.

Nothing conclusive has been done by the mining companies towards putting up the money to pump out the flooded mines on the Comstock.

The picnic season is advancing and the hands are filling the air with stirring melody. The environs of San Francisco are almost daily invaded by hosts of armed men or men clothed in regalias and bearing banners. Every organization is having its annual outing, and its wife and children are getting a breath of rural air and a chase for wild flowers. In the country the roadways are filled with gay family carryalls and speeding teams, and the laughing loads of children make a music sweeter than the measured peals of city bands. It is a joyous season, and California enjoys it to the utmost. It is not to be wondered at that a writer for an Eastern paper dubs California the "picnic State." It is well to have hosts of these merrymakings to smooth away the lines of toil and worry, and to increase sociability and sympathy.

Detection of Nickel and Cobalt in Complex Ores.

[Written for the PRESS by C. H. AARON.]

A mixture was prepared containing nickel, cobalt, bismuth, iron, and manganese as oxides or carbonates. This was again mixed with powdered partzite, a mineral containing silver, copper, lead, and iron as oxides combined with antimonic acid. The whole was then calcined. In such a substance it is not easy, even if possible, to detect nickel or a little cobalt by simple fusion with borax or salt of phosphorous, on platinum wire or on charcoal, even with the resources afforded by the different flames, etc.

Taking advantage of the fact mentioned in a previous article, that nickel and cobalt oxides are converted into soluble chlorides by a hot solution of copper chloride, a portion of the mixture was heated with a solution of two parts of bluestone and one of salt. The clear liquid was boiled with zinc to separate silver, copper, and any lead, bismuth, or antimony which it might contain, filtered and evaporated. The residue, consisting of zinc, nickel, and cobalt chlorides, with probably manganese chloride and sodium sulphate, tested in borax on wire, gave the nickel reactions very strongly, but in a yellow flame the cobalt blue was hardly perceptible. On charcoal the first result observed was one which might have been foreseen; the borax spread over the coal instead of forming a bead. This was rectified in a measure by the addition of a little colorless glass, but it was impossible to obtain the cobalt blue, the slag being either colorless or yellow from sodium sulphide produced by reduction of the sulphate. A borax bead was then strongly colored by cobalt from another source, and some of the matter to be tested was added. On fusion in a yellow flame the bead was completely decolored. With the view of getting rid of the sodium sulphate, the remaining powder was redissolved in water, and solution of sodium carbonates added to precipitate the metals, but the zinc carbonate was so voluminous that caustic soda was added to redissolve it. This left a very small quantity of undissolved matter, which, when collected on a filter and tested, gave the reaction of cobalt, but not of nickel. The use of sodium carbonate was an error, as it dissolves the cobalt and nickel oxides; potash alone should have been employed.

A second portion of the original mixture was boiled with a strong solution of sal ammoniac (ammonium chloride), which, as is known, acts on copper oxide, forming copper chloride and evolving ammonia. The green solution was boiled with zinc, filtered and evaporated. The residue, tested on wire, did not react sensibly for either nickel or cobalt. Perhaps the treatment of the ore was not continued long enough in this case.

A third portion of the mixture was heated in a small quantity of hydrochloric acid diluted with water. The acid was not in sufficient quantity to decompose the whole of the ore, but it produced a green solution containing copper. This was boiled with zinc until all precipitable metals were thrown down, filtered and divided into two parts. The one part was evaporated and the residue tested. It reacted very well, after volatilization of the zinc, both for nickel and for cobalt, on wire or charcoal. The remaining part of the filtered solution was treated with caustic soda in sufficient quantity to redissolve the zinc oxide at first thrown down. A flocculent brown precipitate remained, which whitened on boiling, and again became brown on the filter, but was greenish-gray when dried. This substance reacted strongly for nickel and cobalt on wire before the blue flame, and for cobalt on coal in the yellow flame, notwithstanding the presence of a little iron.

The object of these experiments was to find a comparatively simple yet sure process for the detection of nickel and cobalt in very complex ores, with such simple reagents as are always accessible in the mines. The first experiment was marred apparently by the presence of sodium sulphate. The second was a failure. The third was successful, and in the second modification eminently so. I have not at present an opportunity of continuing the investigation, but believe that the results obtained will warrant me in recommending the following processes for testing mixed ores for the metals in question:

Roast the powdered ore, before the blowpipe or otherwise, to complete oxidation, adding powdered charcoal after the sulphur smell ceases until a garlic-like odor of arsenic is no longer perceptible, burning out all the charcoal at the last. Digest the powder for half an hour in a glass or porcelaine vessel, at or near the boiling point, with a small quantity of strong solution of two parts bluestone to one of salt. Stir occasionally with a glass rod or shake the vessel. Add water from time to time to replace that evaporated, or, if the liquid loses its color, add a little more of the copper solution. Allow it to settle, and pour off the clear liquid into another vessel; wash the ore with a little water, settle, and pour off again into the other vessel. In the liquid place a piece of clean zinc and heat until another piece is not stained by the liquid. Filter, and to the clear liquid add a solution of caustic potash free from carbonate, until the white precipitate at first produced is redissolved. If any solid matter remain it probably contains nickel or cobalt, or both. Filter again, and wash the substance by passing water through it. Fuse a little of the substance in borax on platinum wire beyond the point of the blue flame. If cobalt alone is present, the bead will be blue. If nickel alone, it will be reddish-brown, or violet while hot, and yellow or yellowish-brown when cold. If manganese is present, which may happen, its amethyst color will be mingled with that of the nickel; or if nickel and cobalt are both present the bead will be violet or purple both hot and cold. If the bead be now well covered with a yellow flame for a minute or two, not blowing too strongly, it will, if it contain nickel, become first gray or black and finally colorless, unless it also contains cobalt, when it will be small blue. The nickel may then be seen in the form of black specks in the bead.

Melt some borax to a bead on a piece of charcoal, add a little of the powder and melt under a strong yellow flame. If cobalt is present, the borax will be blue, the nickel being reduced to metal and the manganese becoming colorless. If, in the last-mentioned melting, a bead of pure gold be added, it will collect the nickel, and, on being cleaned by throwing it into water while still hot, and rubbing, it will be found more or less gray in color, and hard or brittle. If this gray bead be now fused on charcoal in contact with a fresh bead of borax, or, better, of microcosmic salt (salt of phosphorus) before the point of the blue flame, the slag will show the nickel color alone, unless, perhaps, a little cobalt may also have been metallized, in which case the gold bead must be again cleaned, and the test repeated until the nickel color is got. The borax bead on wire or coal may be charged several times with the powder, if necessary, to obtain distinct reactions.

For caustic potash, "concentrated lye" will answer, but it should be freshly opened, or the part which has not been affected by exposure must be used. The beads must be examined by the aid of a lens, and those on charcoal should be flattened or drawn up, while plastic, by the forceps. They should not be much, if any more than one-eighth inch in diameter, in order that they may be well covered by the yellow flame when desired.

If a solution of pure copper chloride is used, instead of bluestone and salt, the liquid filtered after boiling with zinc may be evaporated to dryness, and the residue tested as above, except that the fusion on wire should be performed in the yellow flame first, with a strong heat, to drive off the zinc chloride, after which it may be oxidized to obtain the nickel color by holding it for a minute or more beyond the blue flame. It is better, however, to use the potash, because then the nickel and cobalt oxides can only be contaminated by manganese, which does not interfere, except in the test on wire before the blue flame, or by earths which give no color to borax.

Hydrochloric acid may be used in treating the ore, but there is the objection that it is liable to dissolve too much iron, which would interfere with the observations. Iron may, however, be removed by digesting the liquid with copper oxide, or ore containing it. This must be done before the treatment with zinc. If the ore treated contains no copper, it is best to add a little oxide of that metal when acid is used. It is only necessary to take so much acid as will suffice to keep some copper dissolved during the digestion.

It may be that the solution of copper chloride, or of bluestone and salt, would act on the sulphides, arsenides, antimonides, and arseniates of nickel and cobalt. This has not yet been tried, but should it prove so, roasting would be unnecessary. The experiment is commended to those who may meet with the ores.

For the method of making a quantitative assay of nickel and cobalt by the blowpipe, the reader is referred to Richter's edition of Plattner's work on blowpipe analysis, where will also be found the usual blowpipe tests applicable to the various minerals and alloys.

Note.—In the course of some further experiments, a curious effect was noticed. When solution of cobalt acetate was heated with a piece of zinc, a black substance, insoluble in ammonia, was produced. It surprised me by being strongly magnetic, but this was accounted for by the detection of iron, probably from the zinc. It contained also zinc and cobalt. This experiment was repeated with the same result. It seemed, however, that the cobalt was not all precipitated, as the solution obstinately retained a pink color, which became strong purple when heated to boiling, and faint pink, again, on cooling. Another experiment proved, what I had long suspected, that manganese protoxide is converted into soluble chloride by the action of a hot solution of copper chloride.

OVERDONE.—A correspondent of the Bodie *Free Press*, writing from Butte, Montana, says: Locally, house building is flourishing in the city, but competition is so great that carpenters find it almost impossible to get anything to do, and as a consequence the wages have been cut down from $5 to $4, and plenty of men are working in Butte to-day for $2 50 per day. In fact, every other business is overdone to a like extent. The only consolation for the many people coming here is that the country is large enough to hold them all, and strike out for pastures fresh and green, inwardly wishing, no doubt, that Butte was in hell, or some other place. Butte is evidently getting a good send-off in the East, whence nearly all these people came, and who never before saw a mining camp, and are consequently as green as grass; hence the term "tenderfoot."

Mining Classes.

In Europe the questions concerning technical education are being practically tested in many places. Technical schools, institutes, classes and other means of educating boys and young men to fit them practically for the work of life, are established in every direction. On the continent they recognize that much of their progress in mechanical industry is due to the attention they pay to this technical education. In Great Britain they also recognize this, and though they are not so well organized as on the continent, yet the classes and schools are by no means neglected.

Naturally, in England great attention is paid to the mining industry, and young men who are desirous of obtaining information on subjects connected with it have plenty of sources to draw from. There are museums, collections, exhibitions, lectures, schools, classes, institutes, and all sorts of places to look to, and there are plenty of mines and metallurgical establishments to visit and see in practical operation. And such opportunities are not confined to any metropolis alone. The small towns vie with each other in offering advantages for persons to obtain scientific knowledge concerning the business in which they are employed.

As an illustration of the scope of the work of some of the classes, we append some of the questions put at preliminary examinations of Heworth colliery science classes, held in the National school-room adjoining the colliery. The mining papers contained 16 questions, and the students were expected to show how much they had been benefited by attendance at the lecture. The following are the questions:

1. What gases are met with in coal mining? In what seams of coal are they most dangerous, and why? Show how to find their specific gravities. 2. Name the several compounds used in blasting. What are their advantages one over the other, and what especial methods are required to develop these advantages, and what are the special dangers to be guarded against in their use? 3. Enumerate the different classes of rock found favorable in various regions, as country of the lodes. 4. Explain the construction and action of a drawing lift and plunging lift. 5. Describe a method of deep boring, and show how the detritus may be discharged continuously. 6. Define the terms, seam, vein, measures, bade, dip, underlie, dyke, slip, cross-course, slide, shode, costsan, underhand, overhand. 7. Point out the advantages of "splitting the air" in ventilation. What is the object and mode of placing the "dumb drift" in mines ventilated by furnaces? 8. Describe thoroughly a mode of putting down a shaft from surface through quicksand, and explain the operations followed in sinking through ordinary coal measure ground. 9. How is the ore-bearing character of lodes affected by variations in the nature of the rocks forming the walls? 10. Illustrate with figures the question, how far and in what direction hore-holes should be driven in advance, against water. 11. Describe a long-wall method of working coal. 12. Give sketches illustrating the pillar-and-stall method of working coal. Show how creep can be avoided. 13. Name the respective width of lodes. Give six examples. State the methods adopted in working metalliferous mines. 14. Explain the construction and action of man engines. 15. What methods may be adopted for counter-balancing the weight of the rope in deep mines? How would you avoid the "jerk" on the rope at the lift of the load? Describe the construction of Stephenson's, Clanny's, Williamson's and Mueseler's.

WINDING GEAR FOR MINES.—Some improvements, intended to prevent the great wear in the ropes by one coil chafing against the other, and obviating the necessity for coiling the ropes round the drums usually employed, have been patented by Mr. J. Craven, of Wakefield. He employs a single winding rope, an upper set of grooved head gear pulleys, and a lower set of grooved winding pulleys, each consisting of two pulleys and an intermediate grooved pulley between the two sets. The rope is attached at one end to one of the cages, passes over one of the head gear pulleys, under one of the winding pulleys (to which motive the power is applied), and back over the intermediate pulley, and then under the other winding pulley, and thence over the other head gear to the other cage, to which the end of the rope is attached. By this arrangement not only is greater durability of the rope insured, but all tendency to slipping off the rope is entirely obviated, as in proportion as the weight of the load is increased the adhesion of the rope is augmented. The bearings of the intermediate pulley may be carried in a movable frame, either inclined or otherwise, so as to admit of the pulley being adjusted as required in order to maintain the rope taut.

BUTTE.—A correspondent of the Bodie *Free Press*, speaking of Butte, Montana, says: With the inexhaustible bodies of ore they claim to have, all of the mines, mills and smelters cannot, nor do they, ship as much bullion as does the old reliable of Bodie, the Standard. These are facts beyond dispute. The total number of men employed in and around the mines does not exceed 700. The wages for all men working under ground is $3.50 per day; all above, $3.

Shaft Timbering.

In shafts in ground too unsettled to allow of sinking to any considerable depth without support, the work of timhering is necessarily done from above downward, as the sinking progresses. The method of putting the timbers in place is about as follows: When suffioient ground bas been excavated below the last set of timbers for conveniently putting in another lower set, the long horizontal timhers, or sill-pieces, forming the sides of the set, already framed for receiving the ends, and having gains cut for the posts and cross-pieces, or ties, are lowered down and put appropriately in place, boing hung by chains to the last set already fixed above. The sill-pieces are usually in two parts, eaob about 13 ft. long, hutted together at the middle, without splice or framing. The ends, cross-pieces and posts are then fitted as nearly as possible into their proper places.

This heing done, several long round iron bolts, each made in two parts with a tightening screw in the middle, are passed through the new set and the one, or somotimes two or more, above. Everything heing approximately in its place, the new set is adjnsted exactly to its proper position, hy means of the tightening screw on the holts by which it now hangs to the set ahove. The lagging is then put in hehind the timbers, and botween the plaok and the gronnd are inserted pieces of spiling and wedge timbers which are driven into place or are forced in hy jackscrews as firmly as possihle. Ooce fixed in this manner, everything is hcld hy lateral pressure; the bolts hy which the set was at first suspended are allowed to remain for a time and then withdrawn for use in placing succeeding sets.

The shafts on the Comstock timhered in this manner generally stand very well, and are maintained in good condition. When movements of the ground force any part of the work out of line, the disturbed sets may be taken out and replaced hy new, or readjusted without difficulty; and unless the ground is very had, with a tendency to move in large masses, the perpendicular line of the shaft may he well preserved.

When it hecomes necessary to retimher a shaft or any considerahle part of it, the work is usnally carried on in one compartment, while operations are carried on through the other compartments.

All the deep shafts of the Comstock mines have required more or less retimhering. This has been specially necessary in the deeper portions near the vein, where the ground passed through is sometimes very heavy, consisting of massive clay, whioh exerts a tremendous pressure upon the timbers. To withstand this latter, it is sometimes necessary to resort to methods still more snbstantial than that described. Where uncommonly heavy ground is passed tbrough douhle sets are used, an outer set inclosing the ordinary single set, giving additional strength to the frame. The deep shafts of most of the hig mines have encountered very had ground, involving large expense for the maintenance of the work.

Water Balance for Hoisting.

In many of the open works on the northern side of the great coal hasin of South Wales, water-halance machines are largely used for winding purposes, and for mines of not more than 100 fathoms deep; in a district affording a good supply of water and free drainage hy means of adits, they may he highly recommended. Sometimes they are nsed when there is no drainage, the water being pumped up from the hottom hy an engine, but this is not to be recommended. In some cases the machines are placed at different levels, so that the same water is used five or six times, over as many snccessive lifts. The tram, containing from 12 to 20 cwt., is placed in a cage over an empty water-hucket, and the empty tram on a similar hncket at the top. Water is then made to flow into the upper hucket until its weight is great enongh to canse it to descend, so raising the filled tram. On the arrival of the full hucket at the hottom of its fall, a self-acting valve opens and the water is discharged, so allowing the process to he repeated. The hnokets are made of one-half-inch hoiler plate, oircular in form, and some hold more than 2 tons of water. The landing chain is halanced hy a chain which hangs helow esch hucket, and gnide chains are nsed to keep the huckets from striking each other when the shafts are not divided. A speed of 300 to 400 feet per minute is easily attained hy this machine, and the total cost of raising stuff is ahont 1½d. per ton per 50 fathoms. For great depths the weight of the necessary machinery hecomes so great that the economy is reduced or disappears. Somewhat similar machines are in use in some of the iron mines of Cumherland and elsewhere.

JAMES ROWE, the miner who lost both arms and the sight of hoth his eyes in the terrihle hlasting acoident at the Forman shaft several weeks ago, on the Comstock, has gone home to his family in England. As it is through their sympathy and aid that he is enahled to realize the dearest wish of his heart and return to his wife and children, who will be eyes and hands to him, he will through life continne to cherish the most grateful feelings toward all the people of the Comstock lode. As a sum of over $2,000 has been raised for Mr. Rowe, he will not return penniless to his people,

Production of the Precious Metals.—No. 9.

(An abstract of the Census Monograph on the Bullion output of the country.)

NEW MEXICO.

Although during the census year the mines of New Mexico were attracting much attention, their practical development was awaiting the completion of the railroads which were about to interseot it. Its mining districts were, many during the census year and not accounted for below is not of very great amonnt.

The double-column table in these columns give the production of the deep mines by counties.

Placer Mines.—Considerable rich placer ground is known to exist in New Mexico, hut as yet hut little gold has been obtained from it, owing to want of water. No record could he ohtained of any product from such workings during the census year.

NEW MEXICO—Production of Deep Mines for the Year Ending May 31, 1880.

COUNTY.	Ore raised dur ing census year.	Average assay value per ton.			Total assay value of ore raised during census year.		
		Gold.	Silver.	Gold and Silver.	Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Dona Ana	718.5	82.65	.....	82.65	59,386	.....	59,386
Grant	9,668.0	2.62	79.78	82.40	25,323	771,301	796,624
Santa Fe	100.0	20.67	32.32	52.99	2,067	3,232	5,299
Total	10,486 5	8.28	73.86	82.14	86,776	774.533	861,309

COUNTY.	Ore raised and treated.	Average yield per ton.			Bullion produced from ore raised during census year.		
		Gold.	Silver.	Gold and Silver.	Gold.	Silver.	Totals.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Dona Ana	718.5	49.59	.....	49.59	35,632	.....	35,632
Grant	6,734.0	2.04	58.26	60 30	13,722	392,337	406,059
Total	7,452.5	6.62	52 65	59.27	49 354	392,337	441,691

COUNTY.	Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.		
		Gold.	Silver.	Total.
	Tons.	Dollars.	Dollars.	Dollars.
Grant	2,934	.....	230,509	230,509
Santa Fe	100	2,067	3,232	5,299
Total	3,034	2,067	233,741	235,808

WYOMING—Production of Deep Mines for the Year Ending May 31, 1880.

COUNTY.	Ore raised during census year.	Average assay value per ton.			Assay value of ore raised during census year.		
		Gold.	Silver.	Gold and Silver.	Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Sweetwater	843	*27.42	.....	*27.42	*23,113	.....	*23,113
Total	843	*27.42	.....	*27.42	*23,113	.....	*23 113

COUNTY.	Ore raised and treated.	Average yield per ton.			Bullion produced from ore raised and treated during census year.		
		Gold.	Silver.	Gold and Silver.	Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Sweetwater	843	20.55	.....	20.55	17,321	.....	17,321
Total	843	20.55	.....	20.55	17,321	.....	17,321

*Estimated.

MAINE—Production of Deep Mines for the Year Ending May 31, 1880.

COUNTY.	Ore raised during census year.	Average assay value per ton.			Assay value of ore raised during census year.		
		Gold.	Silver.	Gold and Silver.	Go'd.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Hancock	1,800	.....	30.00	30.00	.....	51,000	51,000
Penobscot	400	26.87	5.17	32.04	10,748	2,068	12 816
York	50	6.75	32.30	39.05	337	1,615	1,952
Total	2,250	4.93	24.30	29.23	11,085	54,683	65 768

COUNTY.	Ore raised and treated.	Average yield per ton.			Bullion produced from ore raised and treated during census year		
		Gold.	Silver.	Gold and Silver.	Gold	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Hancock	400	7.50	18.00	25.50	3,000	7,200	10,200
Total	400	7.50	18.00	25.50	3,000	7.200	10,200

COUNTY.	Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.		
		Gold.	Silver.	Total.
	Tons.	Dollars.	Dollars.	Dollars.
Hancock	1,400	.....	42,000	42,000
Penobscot	400	10,748	2,068	12,816
York	50	337	1,615	1,952
Total	1 850	11 085	45.083	56.708

of them, difficult and even dangerous of access, and it was almost impossihle to ascertain in advance whether they had actually producing mines. The collection of statietios under these circumstances was peculiarly difficult, and the completeness of the material ohtained was seriously impaired hy the assassination of Col. Charles Potter, the expert in charge of this Territory. The data presented below do not necessarily give a fair idea of the capahilities of the Territory as a mineral producer. It is believed, however, that the quantity of ore produced

WYOMING.

Wyoming is surrounded on three sides hy important mining regions, hut has as yet developed but few mines within its horders. During the census year, as far as could he ascertained, the actual production of gold and silver has heen confined to Sweetwater county, of which the production is given in the douhle column table.

Statietice of the Eastern Divieion.

The following tables, which are grouped together without comment, are compiled from schedule data furnished hy Prof. Raphael Pumpelly, together with such information as could he gathered from other sources than the direct census investigation. Some unavoidable gaps occur in the tables, arising chiefly from the nncertainty regarding assay values to be expected where mining is conducted on a small scale. The estimates for Michigan and for Tennessee are not included in this exhibit, as they are derived exclusively from material other than that collected directly hy the experts.

ALABAMA—Production of Deep Mines for the Year Ending May 31, 1880.

COUNTY.	Ore raised and treated.	Average yield per ton—gold.	Gold bullion produced from ore raised and treated during census year.
	Tons.	Dollars	Dollars.
Cleburn	100	10.00	1,0 0
Talledega	24	12.50	300
Total	124	10.50	1,300

GEORGIA—Production of Deep Mines for the Year Ending May 31, 1880

COUNTY.	Ore raised during census year	Average assay value per ton—gold.	Assay value of ore raised during census year.	Ore raised and treated during census year	Average yield per ton—gold	Gold bullion produced from ore raised and treated during census year	Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year.
	Tns	Dlls	Dlls	Tns	Dlls	Dollars	Tns	Dollars
Cherokee	202	22.00	3,124	205	11.22	2,300	57	1,255
Cobb a	100	.....	.....	100	4.00	400	.....	.....
Forsyth a	40	.....	.....	40	5.08	203	.....	.....
Hall a	150	.....	.....	1 0	10.00	1,500	.....	.....
Lincoln a	550	.....	.....	550	10.88	5,981	.....	.....
McDuffie a	100	.....	.....	100	6.00	600	.....	.....
Meriweth'r a	1,560	.....	.....	1,560	2.00	3,120	.....	.....
Total	2,792	.....	3,124	2,735	5.18	14,167	57	1,255

a Assay values not given.

GEORGIA—Production of Placer Mines for the Year Ending May 31, 1880.

County.	Gold.
Cherokee	$ 225
Hall	3,7 8
Lumpkin	58,673
Union	1,600
White	2,677
Total	$66,863

NEW HAMPSHIRE—Production of Deep Mines for the Year Ending May 31, 1880.

COUNTY.	Ore raised and treated.	Average yield per ton.			Bullion produced from ore raised and treated during census year.		
		Gold.	Silver	Gold and silver	Gold.	Silver.	Total.
	Tons	Dolls	Dolls	Dolls	Dolls.	Dolls.	Dolls.
Grafton	2,183	5.04	7.32	12.36	11,000	16,000	27,000
Total	2,183	5.04	7.32	12.36	11,000	16,000	27,000

Mining Law Amendment.

A few weeks since we published some comments on a pending bill in Congress, under the title of "Oaths hy Proxy," taking the ground that it was a dangerous precedent to establish, to allow agents to make oath to adverse claims or anything else connected with the mining laws. People in New York can locate claims in California, and if people in New York can take oaths on adverse claims which can keep actual miners on the ground from working their mines for a year or so until the adverse claim is adjnsted at the Land Office, it is, to say the lesst, rough on the miners. The men who go into a mining region, rough it, prospect, and start work on a claim, ought not to he liahle to he ousted hy people who never took any such chances, or who never saw the mines. The new law is very good for the rich man or the corporation. It does not follow that injustice will he done, hut it gives an opening for it, as we explained in the previous article, above alluded to.

The hill, which was introduced hy Senator Hill, has passed the Senate, and is as follows:

Be it enacted hy the Senate and House of Representatives of United States of America in Congress assemhled, That the adverse claim required by section 2326 of the Revised Statutes may he verified hy the oath of any duly authorized agent or attorney-in-fact of the adverse claimant, if residing or at the time heing heyond the limits of the district wherein the claim is situated, may make oath to the adverse claim before the clerk of any court of record of the United States or of the State or Territory where the adverse claimant may then he, or hefore any notary public of such State or Territory.

Sec. 2. That applicants for mineral patents, if residing beyond the limits of the district wherein the claim is situated, may make an oath or affidavit reqnired for proof of citizenship before the clerk of any court of record or hefore any notary public of any State or Territory.

THE 10 stamp mill at Marysvale is now running on ore from the Deer-trail mine, of which there is an ahundant supply. Since the mill dropped its stamps the canyon has presented a lively appearance, and mining matters over there appear more promising than they have done heretofore.

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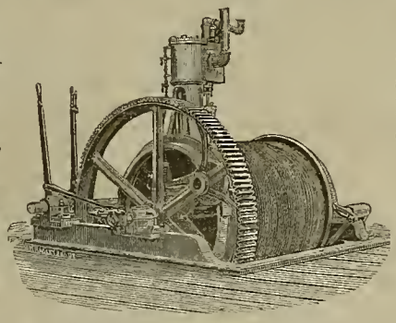

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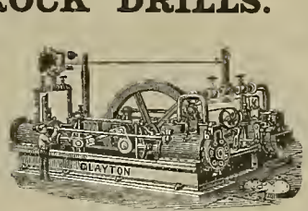

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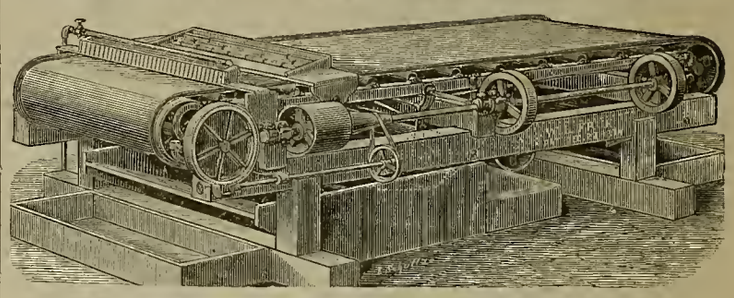

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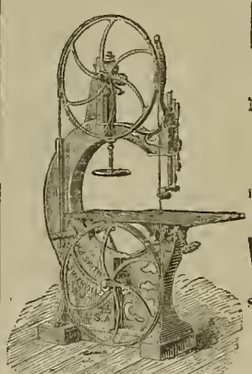

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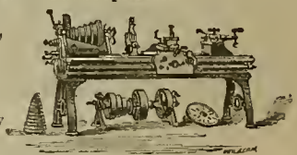

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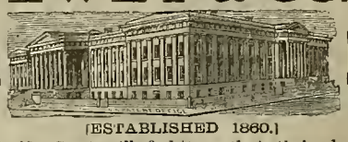

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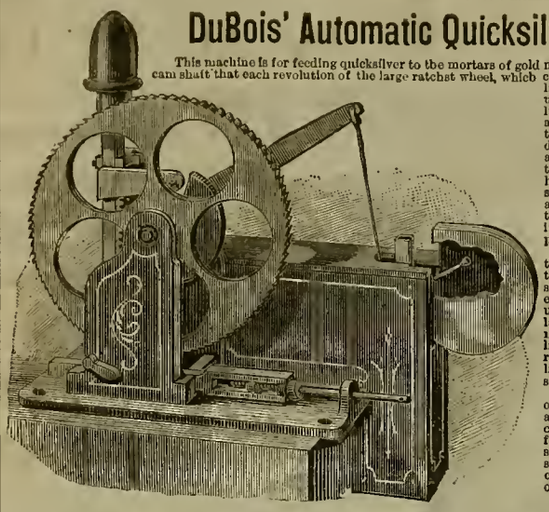

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.
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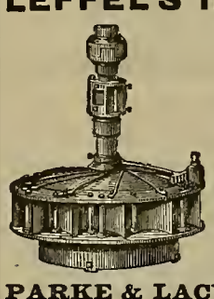

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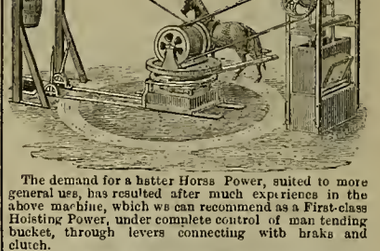

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING MAY 9, 1882.

257,311—PHOTOGRAPH COLORING—H. Austin and L. J. Kimball, S. F.

257,360—APPARATUS FOR UTILIZING SOLAR HEAT—Geo. W. Deitzler, S. F.

257,674—CABLE RAILWAY—Terrence Duffy, S. F.

257,488—NEW GOVERNOR FOR ENGINES—Myron G. Foote, Gold Hill, Nevada.

257,702—UNDERSHOR—Frederick W. Hesse, Santa Rosa, Cal.

257,726—WATCHMAKER'S COMBINATION TOOL—Wm. H. Lamb, S. F.

257,521—STENCIL PRINTING MACHINE—Albert G. Shannon, Santa Rosa, Cal.

257,536—DEVICE FOR COOLING TIRES—Isaac L. Umstead, Ione, Cal.

257,739—HARROW ROCK DRILL—Eugene Morcan, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

CAMERA ATTACHMENT.—Wilfred L. Brown, Mare Island, Cal. No. 256,966. Dated April 25, 1882. The attachment in this invention consists in a novel removable holder for any number of prepared sensitized plates. This is placed in suitable guides upon top of the camera, and is provided with a sliding false bottom, adapted by its movement to expose a slot in the top of the camera, through which any of the plates may be lowered for exposure by means of a vertically moving "plate elevator," and may be returned to the holder by the same means. The arrangement of shutters in the eye-piece, and the means for adjusting the removable plate-holder, closing the entrance aperture, and for raising and lowering the plate elevator are details of construction included in the invention, and necessary to its perfect operation. The object of the invention is to provide a convenient and effective plate-holder, to be used in connection with a camera when carried from place to place, or in field work, where the facilities for developing are wanting.

CABLE RAILWAY.—Terrence Duffy, S. F. No. 257,674. Dated May 9, 1882. This consists in a device for keeping the slot in the street closed, which will protect the tube from foreign substances, yet not interfere with the passage of the grip; and it consists, also, in cleaning attachments upon the dummy adapted to run within the slot and upon the road to keep them clear, so that the accumulations will not fall within the underlying tube while the dummy is passing and the slot temporarily opened. The object of the invention is to provide a means for keeping closed the grip-slot, so that dirt and especially snow, ice, etc., which in cold countries are liable to render impracticable the operation of a cable railway, may not fall down into the tube. An accumulation of material is liable to clog the mechanism, and for this reason a cable tunnel with an open grip-slot has been considered impracticable in places where there is snow and ice.

WATCHMAKERS' COMBINATION TOOL.—Wm. H. Lamb, S. F. No. 257,726. Dated May 4, 1882. This watchmakers' tool consists of a frame having two spring arms passing through it longitudinally, and so formed that their sides may be made to approach or separate. These arms serve as a poising tool for the balance, and also as truing callipers. Upon one side of the frame is a plate pivoted at one end to the frame and having the opposite end movable and capable of being fixed so that one side will make an angle with the side of the frame. Between these sides the roller of the staff may be clamped to be removed. The free end of this pivoted plate is provided with a holding device for the second hands while they are being broached out or fitted, the whole being intended as a handy tool for different classes of work.

APPARATUS FOR UTILIZING SOLAR HEAT.—Geo. W. Deitzler, S. F. No. 257,760. Dated May 9, 1882. This invention relates to an improvement in apparatus for the collection, concentration and utilization of the sun's heat for industrial purposes; and it consists essentially in the use of a cylindrical reflector, in combination with a cylindrical heat receiver of novel construction, and an arrangement whereby the reflector and receiver can be set in the proper position and made to follow the direction of the sun's apparent movement automatically or otherwise. We described the apparatus in detail a few weeks since.

THE temperature of the water flowing from the Sutro tunnel is 110°.

Back Numbers Wanted.

We will pay 10 cents a copy for the following numbers of the MINING AND SCIENTIFIC PRESS: Volume, 13; year, 1866; number, 1. Volume, 18; year, 1869; number, 5. Volume, 20; year, 1870; numbers, 1 and 26. Volume, 22; year, 1871; number, 1. Volume, 30; year, 1875; numbers, 2, 3, 4, 7, 10, 11, 12, 13 and 15.
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252 Market St., S. F.

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A large cylinder Hoe printing press, for country newspaper work, can be bought cheap by addressing
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Rooms (with or without board) can be had in Oakland on reasonable terms, with a family of English people, location, a pleasant one within 3 blocks of Postoffice. Good references furnished and required. Call or address No. 1274 Franklin St., Oakland, or enquire at the office of this paper.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

ANNUAL STATISTICIAN of 1882—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 502 Taylor st. Price, $4.

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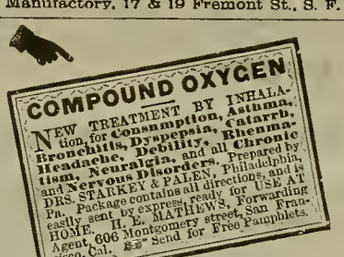
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A NEW TREATMENT BY INHALATION, for Consumption, Asthma, Bronchitis, Dyspepsia, Rheumatism, Neuralgia, Headache, Debility, and all Chronic and Nervous Disorders. Prepared by DRS. STARKEY & PALEN, Philadelphia, Pa. Package contains all directions, and is easily sent by express; ready for USE AT HOME. H. E. MATHEWS, Forwarding Agent, 606 Montgomery street, San Francisco, Cal. Send for Free Pamphlets.

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We are now prepared to do all kinds of
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Marine and Stationery Engines, Rock Breakers, Stamp Mills, Pumping Machinery, Donkey Engines, etc.

Good Facilities for Shipping on Cars.
Works Located Cor. Second and Jefferson Streets, Oakland.
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Two Gold or Silver Mines, with good reports by Mining Engineers of reputation, for customers in England.
MINES WILL BE AS GOOD AS SOLD
If first-class and report favorable.
Apply in person or by letter, to A. M. LAWYER,
45 Merchants' Exchange, S. F., Cal.

LUTHER WAGONER. JOHN HAYS HAMMOND.
WAGONER & HAMMOND,
MINING ENGINEERS,
218 PINE ST., SAN FRANCISCO, CAL.

E. MAIN, 315 Folsom Street,

Makes to order Gents' Fine French Calf Boots from $6 to $10; Gaiters from $3 to $6; Alexis from $3.50 to $5; Mens' Heavy Kip Boots, $8; Oxford Ties, French Calf, $4; California Leather, $3.50; Men's Working Shoes from $2.50 to $3; Children's Shoes made to order. Persons in the country ordering to the amount of $12, I pay the express charges. I sell nothing but my own manufacture.

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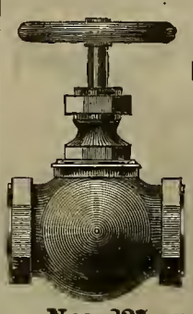
The forwarding of Mining Machinery Material and Supplies A SPECIALTY!
PROPRIETORS GUAYMAS MILLS. MINING SUPPLIES, LUMBER, SALT, ICE, Etc.

W. R. ALLEN & CO.,



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For Steam, Water and Gas,
Sheet Zinc, Iron Sinks,
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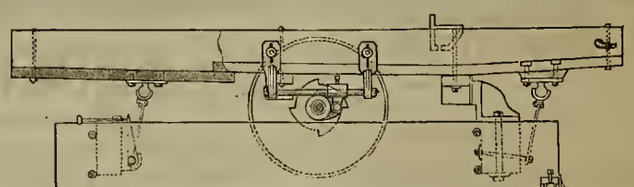

The machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.
The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

Manufactured by
F. A. HUNTINGTON,
220 Fremont Street, SAN FRANCISCO, CAL.
Where a machine can be seen in operation. Also, manufacturer of all descriptions of Quartz Mill Machinery. Send for Circulars.

Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Guadalupe Silver Mining Company—Location of principal place of business, San Francisco, California. Location of Works, Urique, State of Chihuahua, Mexico.

Notice is hereby given that at a meeting of the Board of Directors, held on the 25th day of April, 1882, an assessment (No. 28) of Fifty dollars ($50) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 109 California street, Room No. 13, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the fifth day of June, 1882, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the third (3d) day of July, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. WM. BLACKWOOD, Secretary.
Office—No. 109 California street, Room No. 13, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE
Standard Consolidated Mining Company.
San Francisco, May 2, 1882.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 41, of seventy-five cents (75c.) per share, was declared, payable on Friday, May 12, 1882, at the office in this city, or at The Farmers' Loan and Trust Company in New York.
WM. WILLIS, Secretary.
Office—Room No. 20, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE
EUREKA CONSOLIDATED MINING CO.
Nevada Block, Room 37, San Francisco, Cal., May 15, 1882. At a meeting of the Board of Directors of the above named Company, held this day, a dividend (No. 73) of Fifty Cents (50c.) per share was declared, payable on Saturday, May 27, 1882. Transfer Books closed until the 28th instant.
P. JACOBUS, Secretary pro tem.

PACIFIC IRON WORKS
1850. 1882.
RANKIN, BRAYTON & CO.,
127 First St., San Francisco, Cal.
BUILDERS OF
MINING MACHINERY.

Plans for Gold and Silver Mills, embracing the latest and most improved machinery and processes for base and free ores. Water Jacket Smelting Furnaces for silver, lead and copper ores, with new and important improvements, superior to any other make. Holstiog Works, Pumping Machinery, Chloridizing Furnaces, etc. We offer our customers the best results of thirty years' experience in this special line of work, and are prepared to furnish the most approved character of Mining and Reduction Machinery, superior in design and construction to that of any other make, at the lowest possible prices. We also contract to deliver in complete running order, Mills, Furnaces, Hoisting Works, etc., in any of the Mining States and Territories. Estimates given on application. Send for illustrated circular.

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Special Attention Paid to Patent Law.

N. B.—Mr. J. L. Boone, of the above firm, has been connected with the patent business for over 15 years, and devotes himself almost exclusively to patent litigation and kindred branches

1851. 1881.
DEPUTY U. S. MINERAL SURVEYOR
Surveys for Location or Patent. Maps and Plans Drawn. Mining Properties of all kinds examined and careful reports made of the same. Consultations on Mining Investments Address, THOS. W. REECE, CIVIL ENGINEER, Oroville Butte Co., Cal. References given and required.

"THE $1,000 CHALLENGE"

Ore Feeder for Quartz Mills.

OVER 800 ARE NOW IN USE, GIVING ENTIRE SATISFACTION.

Awarded First Premium at the Tenth and Twelfth Industrial Fairs of the Mechanics' Institute.

Twenty Per Cent. More Ore Crushed with Fifteen Per Cent. Less Wear of Iron than by Hand Feeding.

The accompanying cut illustrates the recently introduced Grip, and also the Spring Attachment, which replaces the Weight heretofore used, and which are obvious improvements.

It is now fully demonstrated, after careful and long continued experimentation and practical use, that the plan upon which a perfect Ore Feeder must be constructed is that of a carrier, and not that of a shaking table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Jerky or spasmodic contrivances will not answer the purpose for wet or sticky ores.

The Challenge Ore Feeders are now in Use in the following Mills, besides many others

Soulsby	20	Stamp	Tuolumne county, Cal.
Sheep Ranch	20	"	Calaveras	"	"
Mahoney	40	"	Amador	"	"
Zelle	40	"	"	"	"
Placerville	40	"	El Dorado	"	"
Gross	80	"	"	"	"
Julian	20	"	Placer	"	"
St. Patrick	15	"	"	"	"
Providence	20	"	Nevada	"	"
Omaha	10	"	"	"	"
Green Mountain	60	"	Plumas	"	"
Plumas-Eureka	60	"	"	"	"
Bulwer-Standard	30	"	Bodie Dis., Mono.	"
Staudard	20	"	"	"	"
Noonday	30	"	"	"	"
Bodie	10	"	"	"	"
Christy	5	"	Uintah Co., Utah.
Ontario	40	"	Parley's Park, "
Contention	20	"	Tombstone Dis, Arizona
Grand Central	20	"	"	"
Harshaw	20	"	Patagonia, "
Sunshine	20	"	Idaho Springs, Col.
Homestake	200	"	Black Hills, Dakota.
Father De Smet	80	"	"	"
Hidden Treasure	40	"	"	"

Superiority of the "Challenge" Ore Feeder Demonstrated!

At the "Christy" Mill, Uintah County, Utah, the "Eclipse" Feeders, (conceived by E. Coleman) were introduced, but not carrying a regular supply of ore for the crushing capacity of the stamps, were replaced by the "Challenge," which are now running and the stamps crushing forty (40) per cent. more ore than was done by the "Eclipse."

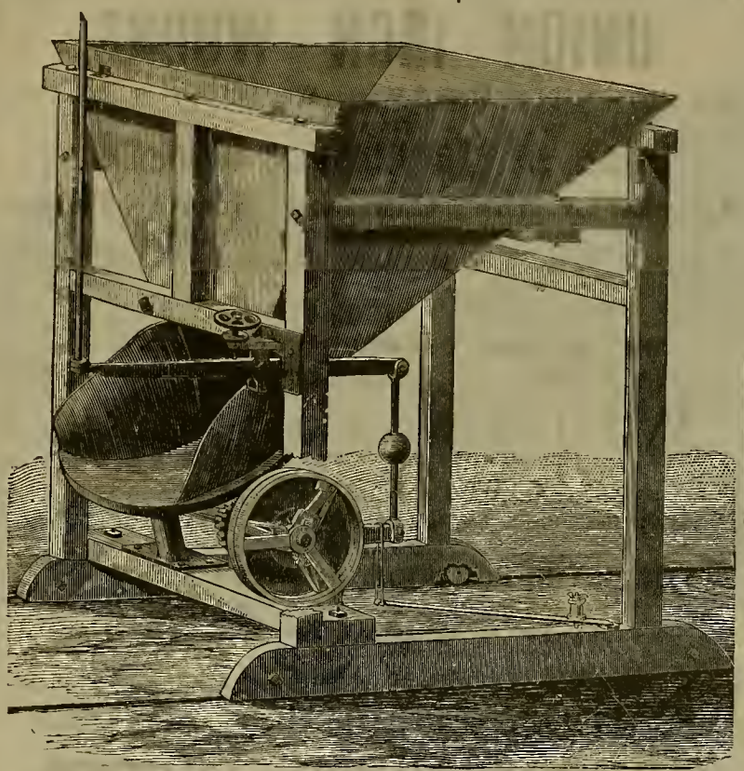
The "Harshaw" or "Hermosa" Mill, of Patagonia District, Arizona, was also originally fitted with "Eclipse" Feeders, but after a few weeks trial they were pronounced inadequate to the work, discarded, and the "Challenge" adopted.

The "Silver King," Mill of Arizona, also removed the "Eclipse" Feeders to give place to the "Challenge."

The "Sola" Mill, of Brown's Valley, Yuba County, Cal., was fitted with "Victor" Feeders, manufactured by E. T. Steen, but proving insufficient, the "Challenge" Feeders were substituted.

Four of the "Victor" Feeders, manufactured by E. T. Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.

These cases are simply cited from among many similar instances, in proof of the vast superiority of the "Challenge" Feeders over all others.



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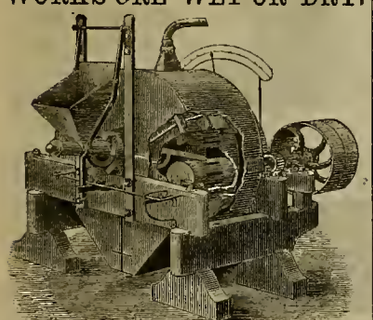

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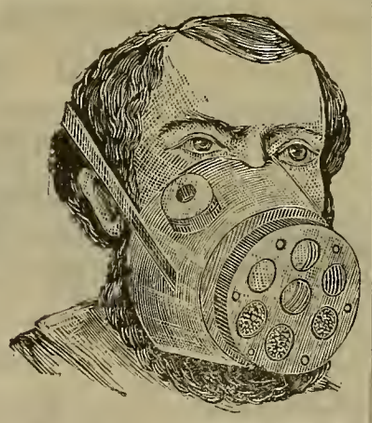

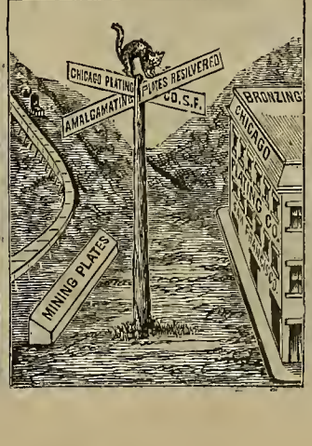

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MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

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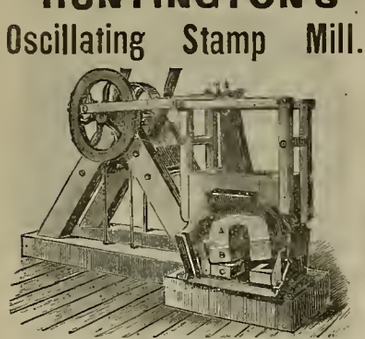
It has no Steps, Cams, or Tappets, and adjusts itself to the wear of the Shoes and Dies.
For simplicity, economy, durability and effective working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power. Awarded First Premium and Medal at Mechanics' Fair, S. F., 1880.
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WORKING PLACER, GRAVEL AND QUARTZ MINES,
SAVE YOUR GOLD!
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SILVER PLATED AMALGAMATING PLATES.
The most economical and successful process now in use. Will warrant my Plates to save more gold than any other method, and double the amount of the same surface of ordinary copper plates. The only plates that have proved durable and satisfactory.
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ORDINARY ENGINES compounded when advisable.
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FROM
1 to 8 Tons Capacity
IN 24 HOURS, ACCORDING TO SIZE.
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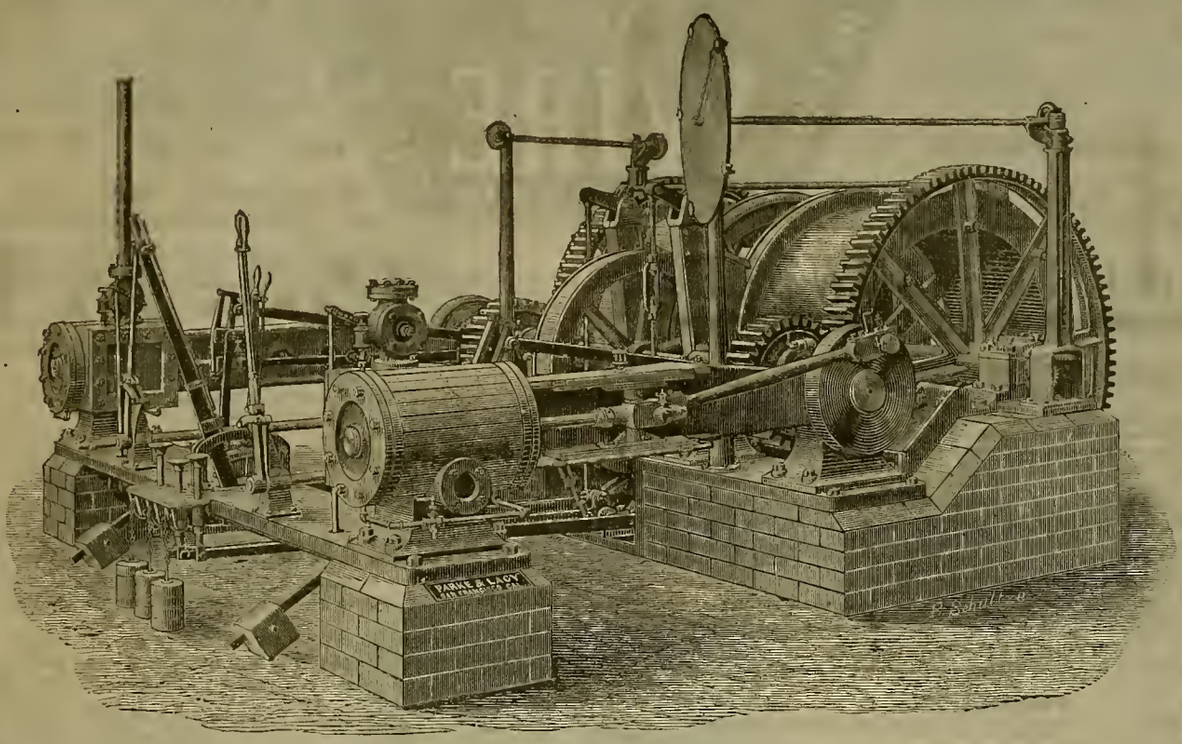

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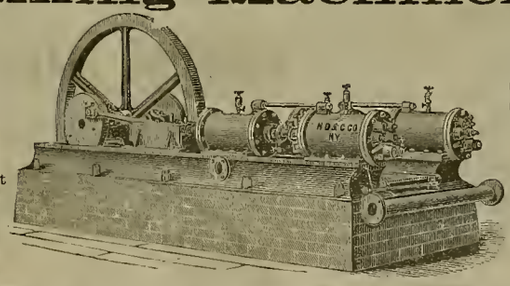

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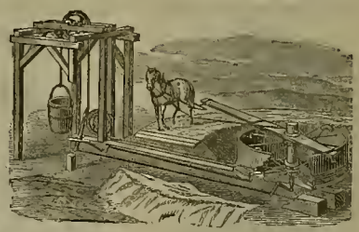

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More Than 16,000 in Use.

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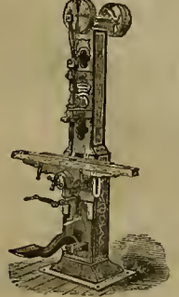

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Blake's Steam Pumps.
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Williamson Bros. Hoisting Engines.
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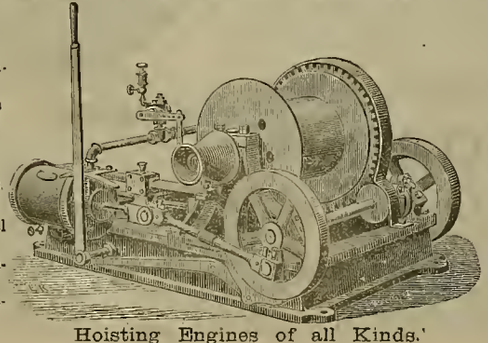

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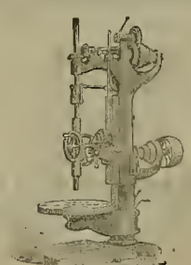

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WIRE ROPES AND CABLES,
Manufactured at my works, guaranteed to be equal in quality to any made, and as cheap, for
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Wire Suspension Bridges and Aqueducts.

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WIRE OF ALL KINDS,
Manufactured at my Wire Mills in this city, superior to any imported, for
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WIRE STAPLES AND WIRE NAILS.
Wholesale and for Export.

VIGORIT POWDER.

NO ACCIDENT HAS EVER HAPPENED.

ALL POWDERS manufactured by the California Vigorit Powder Co. are SUBMITTED during the course of manufacture TO SCIENTIFIC and accurate TESTS for safety and strength.
They are tested for Safety against Friction, Fire, a Temperature of 212° Fahr., and the various shocks to which Powder is liable in practical handling.

The following qualities are common to all grades of Powder manufactured by the Company:
Safety, Non-Leakage; Freedom from Noxious Gases; Uniformity and Strength.
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Send for Pamphlet showing methods of testing the different qualities of all Powders.
The Company manufactures:

DETONITE.
This is an explosive involving new principles and recently ratented. It is the **Strongest Powder ever placed on the Market,** in this country or abroad. It is the **Safest Strong Powder ever made.** For very refractory rock this Powder is the most economical in the market.

VIGORIT, No. 1, XX.
This Powder is **Stronger than the Highest Grades of Hercules or Giant.** It is only surpassed by "Detonite." t is suitable for hard rock.

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For general work this Powder has no superior. It has the advantage over Giant, Hercules or Vulcan in safety and freedom from noxious fumes.

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Equal to any corresponding Grade in the Market.

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This is a Powder suitable for **Bank Blasting, Log Splitting** or the work generally in which Black Powder can be used. It is STRONG R THAN BLACK POWDER, having from twice to ten timca the effective strength, depending on resistance. It is **Superior to Judson Powder,** in being more sensitive to the cap and more convenient in handling.

Best Qualities of FUSE and CAPS sold at Lowest Rates.

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VULCAN B B,
The Best Low Grade Explosive in the market. S rior to Black or Judson Powder.
VULCAN NOS. I, 2 AND 3,
The best Nitro-Glycerine Powders manufactured. Having secured large lots of the best imported Glycerine at low prices, we are prepared to offer the mining public the very strongest, most uniform and best Nitro-Glycerine Powder at the very Lowest Rates.
SPECIAL INDUCEMENTS IN PRICES.
Vulcan B B Powder (in Kege or Caees) is Unequaled
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Caps and Fuse of a'l Grades at Bottom Rates.
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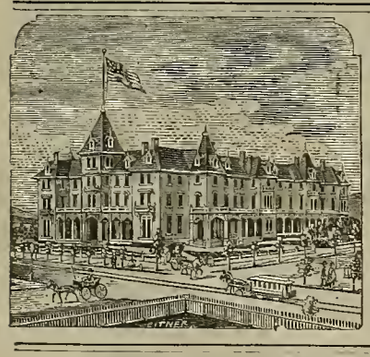

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ENGINE LATHES IN SECTIONS.
COMPOUND PLANING MACHINES,
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STANDARD AND SPECIAL MACHINE TOOLS,
WHEEL CUTTING TO ORDER.
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MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS.
Nos. ONE, TWO and THREE.
Stronger, Better and Safer than any other High Explosive

Judson Powder
IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.
It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. Triple Force Caps and all Grades of Fuse.
BANDMANN, NIELSEN & CO.,
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Containe no Nitro-Glycerine or Chlorate of Potash, and is the only High Exploeive Manufactured in America that doee not contain these Dangerous Ingrediente.

In Use for Seven Years Without a Single Accident.
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EMERY WHEELS and GRINDING MACHINES.
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Orders may be addressed to us at any of the following places at each of which we carry a stock.
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"EUREKA" COTTON GARDEN HOSE.
MILDEW-PROOF AND RUBBER-LINED,
Will positively Not Break in the Kinks, Split Open, or Burst. Very Light, Easily handled, does not deteriorate with age, and is extremely durable. Also, Cotton and Linen Fire Hose. Call and examine it.
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MAY 27, 1882.

VOLUME XLIV Number 21

Tell-tale for Mining Fans.

Among the different apparatus for the safe working of mines is a fan-recorder or tell-tale, invented by Mr. H. Hall, an English inspector of mines. It is a simple and effective means of recording constantly the work of the ventilating machinery, the knowledge of which must necessarily act as a check upon any neglect of those in whose charge the working of the ventilation is placed. This is of great importance, especially in coal mines, where a temporary sticking off of ventilation may lead to fearful disaster. It can be applied to Guibal fans, such as are used on the Comstock and elsewhere.

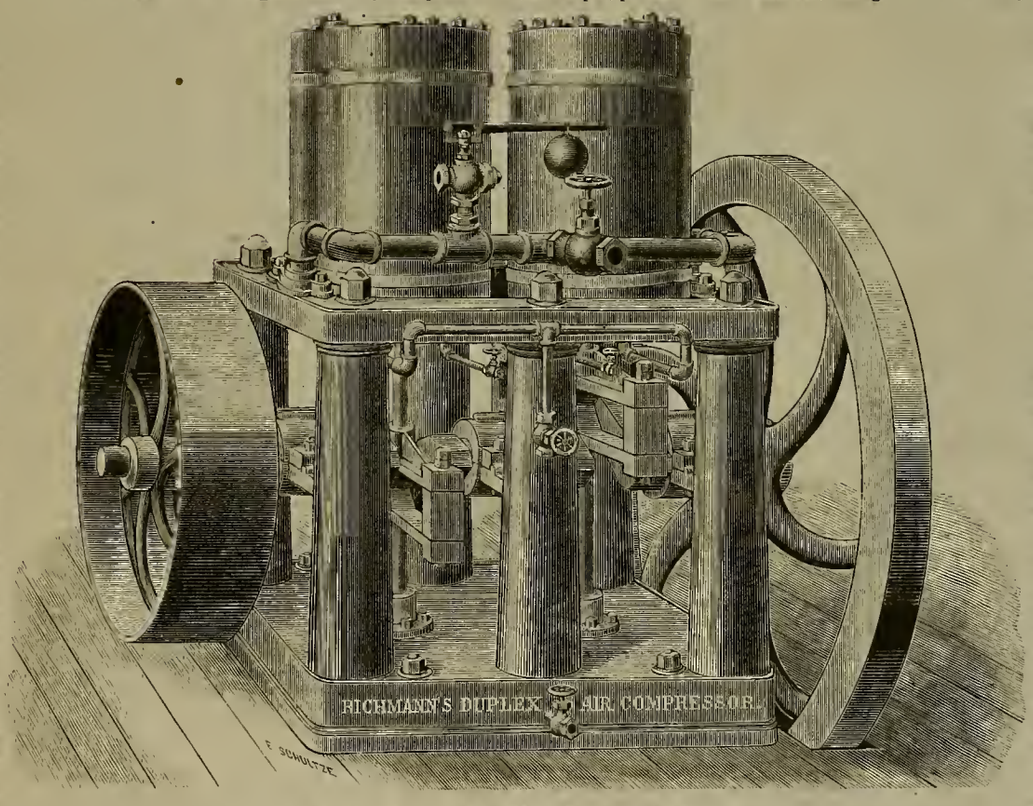
Briefly described, the apparatus consists of a specially designed water-gauge glass, which is fixed in the manager's office or room, and leading from this to the fan-engine house is a range of three-fourth-inch pipes, the open end of which is placed within the fan drift. A short branch of similar pipe is then joined to these, and the open end placed in the fan-engine house, where it is so fixed as to be within reach of some moving part of the engine that drives the fan. To this pipe end is next attached a small lever, with a movement up and down, so as to open and close the outlet of the pipe, and the motion of the spindle plays against this, so that, at each stroke of the fan-engine, the pipe end is opened for an instant, and a variation of the pressure of atmospheric air in the long branch of pipes takes place, causing the fluid in the gauge-glass in the manager's office to fall to zero; but immediately the pipe end is again closed by the falling lever, the water-gauge glass shows the drag, or water-gauge of the mine, and the result is a perfectly correct and constant indication of the drag of the mine, and also of the number of revolutions the fan is making. This taking place in the manager's office, it can be recorded at will, and is entirely out of the reach of the person responsible for the speed of the fan.

As the fluid in the gauge-glass falls to zero at each stroke, it is only necessary to count these movements in the glass to determine the speed of the ventilating machine, and the height of one leg of the fluid over the other between the strokes is the measure, or water-gauge, of the mine. When the fan travels at a great speed, each fifth stroke only is dealt with, and this is effected by the introduction of two small wheels working at five to one, and deriving their motion from the drag-crank of the engine. The cost of this apparatus, Mr. Hall states, does not exceed three or four pounds, unless the distance between the manager's office and the fan is very great; but, so far as the efficiency of the appliance is concerned, distance is immaterial, as it has been tested up to 800 yards. For those who were anxious that the indications should be permanently registered, an eight-day clock could be added, fitted with a revolving brass cylinder carrying a diagram paper, upon which a spiral line was drawn by a pencil, indicating the number of revolutions made by the fan and the water-gauge during every and any hour of the day and night.

In Tombstone, Arizona, is a Chinese washman who has issued cards on which is printed: "Patronize home industry. The American laundry. Un Wo, proprietor."

Richmann Duplex Air Compressor.

We have before described the piece of California mining machinery represented by the Richmann air compressor, and now show a new form—the duplex belt compressor. The Richmann belt air compressor is constructed on the same principle as the steam power compressor, excepting that it is driven by a belt connected with a pulley attached to the crank shaft, which is made long enough to allow an additional loose pulley if required. It occupies no more space than the steam power compressor, and from its lightness is easily transported. No



RICHMANN'S DUPLEX BELT AIR COMPRESSOR.

air receiver is required to these compressors. They are simple in construction, compact, and the various parts so nicely balanced that there is no undue strain upon any one part.

In case water power can be had for driving compressors, great economy is assured, as by an attachment to a water-wheel the compressor can be run without the expense of fuel.

The water-jacket around the air cylinder is arranged to keep a constant circulation of cold water, maintaining a uniform degree of temperature around the valves and the entire length of the cylinder. The air is thus forced into the supporting columns (*i. e.*, the receiver) in a perfectly cool state; and, as no water enters the cylinder, the air is delivered into the receiver free from moisture.

The valves open with the least pressure of the atmosphere, allowing the cylinder to fill up to its full capacity, and instantly close on the return of the piston.

The principle of this machine is the same as all of them. The cranks are set at quarters, however, which is different from the machine we before described. It is double-acting, and requires less power. One of these of this form, with two 18-inch cylinders, has been running for eight months at the Hite mine, in Calaveras county.

This machine is very light and portable. It is unnecessary for us to go into details of construction and operation of the compressor, as we described its points in speaking of the other style. These machines are made by the Richmann Drill Air Compressor Co., Nos. 25 and 27 Stevenson St., in this city.

Smelting in the Spanish Slag Furnace.

The furnace known as the Spanish slag hearth, or Castilian furnace, is a small blast furnace of from three ft. to four ft. six inches in internal diameter, and about eight ft. six inches in hight. It is circular in section, except at the hearth, where it is prolonged forward by a cast-iron hearth-pan, provided with a cinder-bed, through which the reduced metal filters and escapes from time to time, by a tap-hole, into a kettle in which the lead is kept melted for casting into ingots. The shaft of the furnace is surmounted by a rectangular head of masonry, supported on four cast-iron columns, and which contains the door at which the materials of the charge are introduced, as also the aperture by which the gaseous products escape to the fluss and fume-condensing apparatus. The furnace is provided with three horizontal tuyeres, one at the back and one at each side of the hearth, and coke forms the fuel employed. This furnace has a very limited application.

The reduction in this furnace is exceedingly imperfect, the slag produced being black and vitreous, while frequently containing considerable proportions of lead.

The large bullion output of Utah is surprising mining men all over the country, and as they are aware the surface has only been scratched, they wonder what the product will be when the mines are thoroughly opened. As good prospects can now be purchased for a mere song, capitalists cannot find a better country in which to invest than Utah.

Moses Taylor, a prominent New York merchant, is dead.

Mercury and Iron in Amalgamation.

Mercury, when perfectly pure, does not apparently possess, to so great an extent, the power of taking up other metals, or of decomposing mineral combinations, as when it holds a minute quantity of some foreign metal in solution. The experience among amalgamators in Mexico is that the yield of gold is increased by the presence of silver; also, that the latter metal is extracted with greater facility if a considerable proportion of the amalgam is already present. This opinion is held by many mill men in the silver regions of this coast.

It is stated by some writers upon the question that silver is absorbed with increased activity when copper is employed, and as the former is amalgamated the latter will be expelled. Both iron and copper cause the formation of copper amalgam. On the other hand, sulphate of copper exhibits a tendency to drive out lead.

Karsten mentions the property of this salt to purify the mercury from both zinc and antimony. Anyone who has witnessed the intensity which sodium amalgam exerts, cannot fail to have been impressed with the rapidity with which it attacks gold, silver and silver compounds: yet its application on the Comstock in practical operations did not give such results as would warrant its general introduction in the process used there.

Although the presence of a small quantity of several metallic bodies enhances the amalgamating energy of the mercury, yet a slight excess "sickens" it—that is, loses its fluidity and becomes dull and inactive. The peculiar phenomena attending the mercury by which both electro-positive and electro-negative metals are absorbed, and the effects which they produce in increasing or neutralizing its action, are very little understood.

In discussing the chemistry of the Washoe process, Mr. Arnold Hague considers that mercury and iron, under the proper conditions, are the principal agents in the extraction of the precious metals by the Washoe method. The results depend, he maintains, in a great measure upon the mechanical treatments employed to reduce the ore to an exceedingly fine division, and to maintain, with the proper degree of consistency, a constant agitation of the entire mass; the essential conditions of the amalgamation being that the mercury shall be thoroughly incorporated in the pulp and every particle of reducible minerals brought in direct contact and triturated with the metal, in the manner so well accomplished by the friction and grinding action of the pan.

The mercury should also at all times retain a bright, clear surface, free from any film of metallic salts, such as sub-chloride of mercury or sulphate of lead, or any coating of oil or grease. The slightest tarnish appears to retard very greatly the activity of the metals. The iron seems to act as an electro-chemical agent; the immediate contact of the two metals, aided by heat and friction, causes a local electric current, which renders the amalgamating energy of the mercury much more intense.

Mr. George W. Arnold, mining engineer, recently in the employ of the Horn Silver Co., of Frisco, Utah, resigned his position with that company to accept a responsible place in the management of the Christy company.

A New System of Ventilating Mines.

Of late several proposals bave been made for ventilating mines, not only to make them bealthy for men to work in, but to carry off the gases that are evolved from the mineral worked. Some of them would no doubt effect all that could be desired, such, for instance, as the making of large bore-holes from the surface, or really increasing the number of shafts, and as some mines have an air current extending for miles, it need scarcely be said that either system would he most costly, and such as very few owners could afford under the most favorable circnmstances of trade. The use of pipes for tbe escape of the gas has been frequently urged, hut most of the plans are either too costly to be carried out, or are found to be imprscticahle hy mining engineers. The latest addition to the many schemes brought forward is one hy Mr. W. H. Jenkins, of Pontypridd, which we are told was bronght under the notice of mine owners some time since, bnt evidently witbout effect, and now it ie open to those who may he desirous of trying it. The proposal is that hesides the ventilation obtained by means of the furnace or the fan, a powerful air pump should be placed on the surface snd connected with a series of ges pipes, which should he laid throughout the whole of the mine, terminating in esch working plsce, and at various points in the headings, the pipes for the latter being larger than the other. Then the months of each of the pipes are to be connected with a valve attaohed to a thin india-rubber hag made in the form of a cylindrical ring, the hsg heing capahle of cont ining 2,998 cubic inches of hydrogen gas, which in pure air has an upward tendency of 835 graine. Such being the case, the pressure of the valve on the mouth of the pipe in pure air, it is stated, would he equal to 189 grains, and the downward pressure to set the valve at rest in an air-tight receptaole made to receive it, when surrounded by light carbureted hydrogen gas, would he eqnal to 188 grains, that heing the difference between the weight of the bag and valve and the like cubic contents of gas so dieplaced, and so leaving the pipe open to the action of the pump. On carrying ont this system, it appears that if it is considered desirable to extract the gas with a larger admixture of air than one-half, all that is required to be done is to add to the weight of the valve, and should the upward pressure he merely a few grains, the suction of the pump during the up stroke would be sufficient to keep pure air out of the stall and heading pipes, whilst during the down stroke the valve would have sufficient time to drop if the air got mixed with gas.

But we should say that it would not be necessary to bring out a mixture contsiuing more than one-half of air, for even where there is one-third gas and two-thirds air there is an insufficiency of oxygen to keep light hurning, wbilst the less air that is extracted from the workings, so much better for the workmen and the ventilatiou of the mine. Tbe gas and the air, of course, would readily mix together, for it is found that several aeriform fluids of different densities are contained in the same vessel, or by vessels which communicate by simple and very narrow openings; the gases in the first instance have a tendency to arrange themselves hy order of density, but at the end of a longer or shorter time they form, without a single exception, a mixture perfectly uniform. So it follows that when several gases occupying equal volnmes under different pressures sre united in a space equal to the volume of esch one taken separately, the pressure of the mixture is equal to the amount of tbe pressure of the mingled gases. Returning, bowever, to Mr. Jenkins and his system, he states that the principal pipes could he constructed in the form of a whistle without any impediment to their acting as escapements, for when tbe pipes were open, which would be the case only where gas existed, the suction would produce a shrill sound, which would announce the presence of danger to the men working near. As to the hags and valves getting out of order, they would be prevented by having a light metal cap somewhat in the form of an inverted saucer fixed as closely as possihle over each hag, snd the inner diameter of every hag filled in with a very thin sheet of India rubber, so that the whole of the upper surface would he thoroughly protected from auy accumulation likely to affect their weigbt. With respect to the goafs or open spaces where the gas generally accumulates, and in large quantities, Mr. Jenkins suggests that air-tight partitions should be formed between them and the workings, with a six-inch pipe inserted in the higher end of each goaf, all being connected with a separate goaf-pipe leading to the surface of the ground, and at the lower end of each goaf, an opening should be left near the floor, so that should any fall take place therein, the gas, instead of being forced out into the workings, as it is under the existing system, would he forced at once to the surface of the ground, and the vacuum so formed would he replaced with air from the opening at the lower end of the goaf. As the flow of gas in all likelihood would not be sufficient to keep open a nnmher of valves equal to maintaiuing the pump in full draft, safety valves could be placed as far from the bottom of the shaft as possible, and so constructed that they would not be open unless the euction applied for that purpose wae equal to 30% of the breaking strength of the pipes. Where there was a probability of the main pipes being damaged by pressure from any cause, it is suggested that the pipes should be made of guttapercha, lined with a spiral wire, which would naturally give very much before it was damaged.

Such is the proposal of Mr. Jenkins, who candidly admits the possibility of its being improved npon, and so adapted to the saving of life in mines. One part of the system, that relating to pipes, is by no means new, bnt the ventilating bag or valve is certainly a novelty. But we must suppose that an extra shaft or large hore-hole would be necessary for carrying out the system. The running of a series of pipes, too, in all directions throughout a mine would be no easy matter, whilst it could not fail to interfere with the ordinary operations of the workmen, and in the passage to and fro of the trsms. Then the taking of a nine-inch pipe from the goaf to the surface would be a rather serious matter in many ways, for some of the roads and working places are not so laid out or made as to admit of large and small pipes. But even admitting the practicability of this scheme, then comes the question of cost to be tsken into consideration. The mine owner could not he expected to go to the expense of carrying out an entirely new system for the drawing off of the gas, and the lessor of the minerals would say it was no business of his. Then there is the government, and we need scarcely say that no hope would lie in that quarter for making a grant of money for the working of mines, for the safe working of which the owners are now liable. Bnt there is one omission in the scheme of Mr. Jenkins which we should like to see defined, for on it depends the whole of the position, assuming that it could be carried out, and that is the cost. Take, for instance, a mine 400 yards from the surface, with air courses eight or nine miles long, what would be the probsble expense of the system? Furnished with this, one might be ahle to come to a conolusion as to whether it is likely any mine owner would be found willing to undertake the cost in the event of his believing that the scheme would be successful.—*London Mining Journal.*

Working Dry Gold Placers by Centrifugal Force.

The following extract from the *Mining Record* describes a devise for obtaining the precious metal by centrifugal force, without the agency of water, from sands containing gold :

At an iron foundry on West Twenty-seventh street, a machine was exhibited yesterday, which, it is claimed, will, at a cheap rate, separate gold dust from sand witbout the agency of water. The device is intended to meet the requirements of the placer region of the West, Mexico and Central America, where vast tracts of gold-hearing sand are found miles distant from any source of water supply. To illustrate the working of the new invention, the exhibitor scattered an ounce or so of gold in a granular state through a hushel of coarse sand, wbich was placed in a vessel, shaped like the hopper of a mill. From the taper end of this it was theu allowed to pour between two curved copper plates, situated horizontally and revolved at a speed of from 65 to 80 revolutions a minute. Passing betweeu these two plates the sand is driven by centrifugal force against a "wall" of mercury, which is also maintained through the action of centrifugal force. Surrounding the copper plates is an iron ossting like an iron stew pan with the greater part of the bottom cut out, so that its half section resembles a letter L. This is connected with an axis by four hollow arms, each of whicb is made to contain about 50 lbs. of mercnry. The whole arrangement is revolved in a direction contrary to that of the plates, and by a rotary force the mercury runs from the arms through grooves provided, and climbs along the upright surface, corresponding with the upright stroke of the L, thns forming a perfect wall. Every particle of gold, as it is thrown, instantly amalgamates with it, while the sand is partly thrown off by its own rebound and partly blown away by a series of pipes attached to a blower used in connection witb the machine.

When whatever quantity of sand tbe operator chooses is passed through, the machine is stopped, the mercury is withdrawn by a trap from the arms, into which it falls the instant the rotation ceases. It is then strained through ticking, in the way well known to all miners, and the gold is finally cleared of it, througb the agency of heat in the common way. The experiment resulted in the recovery of the gold originally mixed with the sand, without sensible diminntion, and the advantages claimed by the plan are: First, that it extracts every particle of gold from the matter passed through it; and, second, that it does so without any serious loss of mercury. It is claimed that it will open up vast stores of the precious metal not at present available, and will even render it possihle to work over again with profit the "tailings" of mines operated under old systems. The ontside diameter of the machine shown was five ft., and it was claimed that with it ore or sand could be worked at the rate of a ton in less than 20 minutes. Among those who witnessed the trial were several representatives of Western and Southern America mining interests.

For a long time past tbe utilization of dry gold placere has been a desideratum, but as yet no instance is known in wbich any rational attempt commanding the proper kind of technical advice, as well as the financial means required, has been made in this direction. The San Pedro and Canyon del Agna company, of Boston, preferred to nneuccessfully apply in New Mexico, where there is no water, the methods of California, wbere there is water, at an expense of $250,000, rather than to spend a few thousand dollars in an investigation as to the possibility of working their placers without water.

Very erroneously it has been assumed that the successful working of dry gold placers depends on the invention of a machine for the separation of the gold from the sand. Such preparations can be perfected in several well-known ways with the aid of several good apparatuses, either patented or free for use by all, and there is certainly no difficulty in effecting such separation.

In other words, the difficulty is not solely a technical one, and the technical part, as far as the separtion of gold and sand is concerned, has been solved practically in an absolutely satisfactory way, hut what remains to do is the successful handling of large amounts of material without the aid of water for so low expense as will not materially surpass the expense of handling the material with the help of water, say at not more than five or 10 cents per ton of 2,000 lb.

It is important to know that 99 tons in 100 may he handled and all the gold may he collected in one without the use of any special separator, on account of the difference in size of gold from the size of the land and gravel occurring in the same bed with the gold.

The success of working dry placers is, therefore, dependent on general engineering skill in moving at low cost dry gravel, and on special skill in treating ores so as to retain the gold within a small part of the total mass, and nltimately on treating the retained small part for separation proper. It is in this sense only that the foregoing deserves attention.

The Mines of Venezuela.

The eastern division of Venezuela comprises the valley of the Orinoco, containing gold fields and other mineral riches, of which the value is now estimated as exceeding that of any gold district at present explored, the magnificent water-way of the Orinoco and its tributaries stretching away into the Republic of Columbia, with Cumana and Carupano, on tbe coast, and Cindad Bolivar, on the Orinoco, as ports for sea-going vessels. It is to be regretted, writes Colonel Mansfield, that more exsot and copious information is not forthcoming respecting the mines in Venezuela, which are yearly becoming more productive, and, as regards gold, will certainly, in the course of time, be recognized as some of the most important gold fields in the world. The mining companies of El Callao, Nueva Hansa, Mocupia and New York, Potosi, Caratali Nueva Quebrsda Limitada, and the Revilla Con. mines, respectively in the States Gnayana, Yaryacuy and Cumuna, during the year 1880 imported, free of duty, 1,303,737 kilos. of machinery and goods for mining purposes. It appears that since 1866 there has been exported from Ciudad Bolivar 840,045¼ onzas of gold. No information has been published respecting the gold exported from other ports, or of the produce of the copper mines at Tucacas. The lattsr are worked hy an English company, and the number of British subjects employed is very considerable; while in the gold districts of tbe Orinoco there are whole villages of British subjects from Trinidad and Jamaica, amounting to upwards of 6 000 persons. Of industries, properly so called, Venezuela posses none, as, owing to the high price of labor and manufacturing inaptitude of the population, it is cheaper, notwithstanding the high tariff, to import from abroad. There is little douht that the value of British produce imported into the Republic amounts annually to a sum much in excess of £1,000,000. The consumption of British goods is clearly on the increase, and inasmuch as the number of vessels plying to the United States has not increased, there is no reason to suppose that American goods are, up to this time, supplanting British manufacturers to any very serious extent.

A Modification of the Daniell Cell.—Among recent introductions of electrical appliances is a cell without acid—the copper plate being surrounded hy a solution of sulphate of copper, and the zinc hy a solution of caustic soda. The porous diaphragm consists of parchment paper folded into the required shape, two or three thicknesses heing used, according to the resistance required. The zinc and copper plates are provided with two longitudinal slits, being two-thirds their length, and are hent so as to form three sidea of a parallelopiped; the parts between the two slits are turned hack and upward, and, reaching above the liquid, form the connections of the cell. In this way all waste in cutting out the plates, as well as soldered connections, are avoided. The electromotive force of the cell varies from 1.47 to 1 35 Volt., the latter value being reached after the cell has been for a considerahle time on short circuit, and its internal resistance for a cell 20 cm.—7.87 inches—high and 3 liters—2.64 quarts—capacity, is about .075

Men at Candelaria.—A correspondent, speaking of Candelaria, Columbus district, Nevada, says: The mines are doing considerahle work. At preeent the only hullion producers are the Northern Belle and Mount Diahlo. There are in the neighborhood of 400 miners and prospectore at work in the district. Pending the arrival of W. J. Sutherland and other New York parties, who expect to make things lively, there is a surplus of working men there at present.

Use Your Own Judgments.

While there can be no period assigned to the work of prospecting along Wood river, and far along from peak to peak in the mountains of Idaho, nevertheless, the time has come when the planting, at proper points, of machinery and furnaces and cupels for reducing and refining is demanded, for the utilization of veins already well opened and plethoric with ores fruitful with metals of commercial value. Experts and practical mining men have been and will be sent into the country this season, hy and in the interest of capitalists, to invest in properties and to establish and erect the necessary works for converting the orude ores into hullion. These agents will be, generally, men of proper technical qualifications, capable, when they have examined a prospect or ledge, to form an estimate of its probable value, and competent enough to take in all the surroundings and select a site for any proposed works, having due regard to the tributary material for carrying on productive operations. Where they really possess experience, and are left wholly to their own unbiased judgments, they will he governed in their choice by a careful consideration of such facts as the accessibility of fluxes, charcoal, and other essentials to the business. But there will be some who will listen to town claquers and runners for "wild-cat" mines, who will be drawn in and stuffed with all sorts of bogus honanzas and holes in the gronud, attracted more by the numher of locations in the 'group" than by any tangible evidences of ledges or ledge matter.

Mining, perhaps, opens wider the doors to tbe sinister play of designing men that any other legitimate industry; hecause on the flanks of the real prospector there always hang a species of parasite, who hope as middle-men and promoters to get their fingers in, and make thrift of the labors of men of industry. It is the interest of the substantial men of Wood river to prevent rather than to promote mistakes hy the men who come as the representatives of capital. A few hlunders, either in the purchase of mining properties or in fixing the location of smelters, and it will require, perhaps, a year or two of time wasted to correct the impressions oreated by disaster, whicb might readily have heen avoided hy proper vigilsuce and good judgment. In other words, let us have no "hlack eyes" given to the oountry, when the way to prosperity is olean-cut and olear to men of good will, who will use, and not abuse, the solid resources of this region.—*Wood River Times.*

Northern Gold Fields.—A new mining district of unprecedented richness has just heen discovered in northern Montana. It comprises both placer and quartz diggings. The placers produce ahout $40 a day to the man, and the quartz assays in high-grade silver from $3,000 to $12 000 per ton, and is free milling. The gold quartz has not opened very extensively yet, but enough to know its true value. The hest developed mines are the Chollar and Montana, both of which now have over $100,000 on the dump waiting machinery. The prinoipal town is Maiden, situated at the head of Wsrm creek, about four miles from Fort Maginnis, and town lots have advanced in value from $50 to $1,500 within the past two or three weeks. There is now in the place about 100 business houses and enongh saloons and other things usually found on the frontier for a city of 20,000 in the East. They have one good hotel over 100 feet long, and this and all others are crowded. Carpenters get $5 per day, miners $5 and $6, and common laborers $4.

The Auburn Mill.—G. R. Walker, who has been out to the Auhurn mill, informs us that the mill is running splendidly and is crushing 40 tons of ore every 24 hours. The tramway is capahle of carrying 100 tons of ore a day from the mine to the mill, and it is working as well as oould he expected or desired. Mr. Walker has seen many mills, and helped make machinery for several, snd he says he never saw machinery work smoother or better than that in the Auburn. The mill has been running a few days, and if tbe ore pays as well as that worked at the first trial, the Auhurn company's property will be among the most valuable properties in the State.—*Silver State.*

Preparing for Work.—The Blue Light copper mining compsny is preparing for active work on the smelter at Soda springs. Surveys will be made for the smelter and for a railroad side-track thereto. Ditches or pipe lines from the springs back in the meadow will he viewed and the general preliminary work and plans required hy such an undertaking will all he perfected in a short time. Messrs. Williams & Bisbee, the principal owners, are thorough copper miners and will have things in proper shape for the rapid reduction of ore from the mine.—*Candelaria True Fissure.*

The Sulphur Business.—Supt. Rhodes, of the Humholdt sulphur mines, was in town yesterday. He says that in conseqnence of the high water in the river tbey have not heen hauling any sulphur to the railroad this spring. They are getting everything in order for a good summer's run at the minee, and have about 500 tons of crude sulphur on hand that yielde ahout 55% of pure hrimstone. The refining worke will he started up eoon and run steadily duriug the summer.—*Silver State.*

Nearly 7,000 immigrants landed on Monday at New York.

MECHANICAL PROGRESS.

Steel vs. Iron for Steam Boilers.

A late number of *Wood and Iron* contains quite a lengthy article designed to show that steel, and especially American steel, as now regularly made by well-established and responsible houses, is a far better material for steam boilers than any iron that has ever been made. In proof of which the journal quotes the following

English Authorities on the Subject:

"In 1856-57, Shortridge, Howell & Jessop, of Sheffield, brought their homogeneous metal prominently under the notice of boiler-makers and ship-builders, and induced the admiralty to give it a trial. The results were highly satisfactory, but we do not find that it was adopted to any considerable extent for boiler purposes, probably from its high price more than any other cause." (Jeans on Steel, p. 748.)

"Several boilers were made of this homogeneous metal between 1857 and 1859, by D. Adamson, of Manchester." (Jeans, p. 750.)

"Adamson's steel boilers are now used extensively, both for stationary and locomotive purposes. Upward of 1,400 steel boilers of all kinds have been made at Adamson's works." (Jeans, p. 75.)

As to the results obtained by the use of the steel boilers, Beesemer himself stated, in 1869, that "they have found also an economy of fuel, since the thinner boiler transmits the heat more readily than the thicker ones previously in use; and probably from an another circumstance, viz., that the metal is not in that laminated condition in which ordinary iron is; the heat passes through a purely homogeneous body from the outside to the inside, and there is therefore no interruption of heat. There is another point which is most interesting, inasmuch as a blister never occurs. We cannot have a blister upon the cast-steel plate, simply because there are no two surfaces imperfectly united." * * *

"The wear of a steel plate is only a simple case of oxidation, and that is a very slow process in comparison to the blistering of ordinary iron." (Jeans, p. 752.)

"Mr. John Hicks, Member of Parliament for Bolton, bore early testimony to the advantages of steel over iron, maintaining that although a steel boiler costs more per cwt., say 50% yet, an entire boiler of the same length and diameter costs only 20% more in steel, while 11 ft. of heating surface in a steel boiler was as effective as 14 ft. in an iron boiler, thus indicating that the cost of the effective horse power in the former was not more than in the latter." (Jeans, p. 753.)

Lloyd's surveyors say that steel "at first sight recommends itself by its tensile strength, malleability and ductility, and also by its freedom from laminations and blisters, as eminently suited for the construction, not only of the shells and stays, but also of the furnaces and combustion chambers of marine boilers." (Jeans, p. 760.)

"In the spring of 1878 there were 27 boilers made of mild steel, under the inspection of the engineer surveyors of Lloyd's Register, with reductions in the weights of the shells and stays of about 25%. In the first few sets of these boilers it was deemed advisable to submit the material to some severe tests. * * * The mean of the results of over 80 tests gave a tensile strength of 27.5 tons per square inch, while the extreme variations of strength in the different plates manufactured by different companies and by different processes, was not more than four tons per square inch. * * * In order to prove that the material does not suffer from the effects of repeated heating and cooling, two pieces of plate were made hot and quenched in water repeatedly—one 50 times and the second 100 times—but without any apparent injurious effect upon the temper of the material. * * * The satisfactory nature of these tests and the information gained thereby, enabled Lloyd's surveyors to dispense with many of them in subsequent cases, the actual tests now required being much less stringent." (Jeans, p. 760.)

Mr. Barnaby, chief constructor of the British navy, in 1878 said: "In the royal dockyards we are coming to this position, that the admiralty, instead of using iron of the quality they had been obliged to use previously, proposed for the future to use only steel, and he believed they would not only gain in strength, but in point of money also."

In 1881 fully 25% of all the tonnage built in Great Britain was of steel, and the amount of steel used would have been greater if that article could have been obtained.

Similar experience and practice are recorded for Germany and Belgium.

American Steel.

Since about 1863 the Pennsylvania Railroad company has used nothing but American cast steel, low in carbon, in its locomotive boilers.

In the early manufacture of American cast steel, there was much complaint of its lack of uniformity; the trouble was found to be the presence of phosphorus. That has long since been obviated, and Mr Cramp, the well-known Philadelphia shipbuilder, has recently said: "So far as my experience is concerned, the steel of this country is better than the steel of England. * * * Yes, I would always insist on the use of steel in the construction of boilers."

Mr. James Park, Jr., during an examination before experts in Boston, said: "The United States is the prime mover, the originator of that manufacture, and has succeeded in making the best cast steel for steam boilers and for the construction of naval or other vessels that is produced anywhere in the world. The quality of steel plate has not yet been brought up in any country to the standard of ours today."

Mr. Sherman, on the same occasion, said: "That is perfectly true. * * * Yes, I had eight years' experience in Europe, in England, Austria and France, in the manufacture of steel, and since my return I have been in constant communication with gentlemen there, and know what is going on in this line, and I know that we are now producing an article very superior to anything they are making in either of those countries."

THE FATHER OF WOOD WORKING MACHINES.—The machines and appliances for working wood that were invented and practically applied by Mr. Samuel Bentham, previous to the year 1800, may be enumerated as follows: Machine for planing and forming moldings; improved planing and molding machine (rotary); wedging guard for circular saws; segmental circular saws; conical cutters for dove-tail grooves; undulating carriage to form wave moldings; compound cutter heads to work two or more sides at once; the slide rest; tubular boring implements (core boring); crown saws (or cylinder saws); reciprocating mortise machine; rotary mortising machine; radius arm, for sawing segments; tracer guide, for sawing irregular forms, bevel and curve sawing; machine for grinding saw blades; taper gauge for sawing; grooving table; vertical adjustment of saws in benches; rebating machine; sectional cutters; pivoted table for mortise machines; forked or double mortise chisel; gauge lathe, with slide rest; rotary cutters, for forming screw threads on wooden screws; double grooving saws; rack feed, for planing machines, with many other things. The slide rest is very fully and clearly described in Bentham's patent of 1793, and it ranks with the greatest as an invention in engineering implements. It gave us the machine lathe, without which our modern practice in machine fitting could not be carried out. The facts adduced will be sufficient to show that Sir Samuel Bentham is entitled to the distinction of being called the father of wood-working machines in England, at a date that precludes any probability of his inventions having been anticipated in other countries.

A MONSTER MACHINE.—"We hear," says the *Manufacturers' Gazette*, "of a Newark (N. J.) firm, Watts, Campbell & Co., having just completed for a Pittsburg (Pa.) foundry, the largest machine ever made in the United States, and probably the largest in the world. It is a boring and turning machine, which is so large that a special building had to be erected to put it up in. It weighs 110 tons, is 25 ft. high and occupies a space 30 ft. square. It will turn, bore and cut a keyway in wheels of any size up to 16 ft. in diameter by 11 ft. wide on the face. This ponderous machine is most delicately and accurately adjusted in all its parts, and can be regulated to any desired speed. A belting from the engine runs around a cone pulley connecting with a gearing under a revolving face-plate, the gearing being adapted to various rates of speed so that it can be made to go fast enough to bore a six-inch hole, or slowly enough to turn a wheel 30 ft. in diameter. Two massive iron stanchions support a heavy cross-head, with two "saddles" for tools, these being adjustable at any desired angle for boring. These stanchions are movable, so that the cross-head can be brought directly over the face-plate or moved away from it."

THE VALUE of iron beams and posts in the construction of large buildings is becoming seriously questioned. Gen. Meigs, of the War Department, who has given some attention to the matter, states the superior advantages of thick wooden pillars. He says: "The safest story post—*i. e.*, a post supporting a floor at reasonable cost—is one of some hard and not resinous timber. Posts of oak, of 14 inches square, will stand safely through almost any fire, until the powerful force and means of our city fire departments are unable to quench the fire. If wrapped with wire netting, covered afterwards with plaster, they will suffer still less; but the naked wooden poste will remain cool and strong in its center for hours, and the fire will not for a long time char it to a depth sufficient to much injure its strength." It is believed that if round pillars instead of square ones were used as above, there would be fewer available points for fire attack.

A TREE OF IRON.—There is a curious work of art on the grounds of the State House at Columbia, S. C. It is an iron casting commemorating the South Carolina soldiers who died in the war, whose names are inscribed on brass tablets at the base. A correspondent says: "The success of this casting consists in its perfect imitation of the living palmetto—the favorite tree of South Carolina. We had heard of this statue in other places, but had never been able to believe the stories of the flexible leaves bending in the breeze, supposing this phenomenon an optical delusion, but such is really the case. The long, thin leaves of iron, lifelike, even to the hair-like fibers of the twigs and branches, wave tremulously in every zephyr, and the whole tree, painted artistically, has so close a resemblance to the real tree as to deceive the acutest observer at the distance of five rods."

SCIENTIFIC PROGRESS.

The Propagation of Magnetic Waves in Soft Iron.

Mr. Harold Whiting has been making a series of experiments relating to the propagation of magnetic waves in soft iron, from the results of which he draws the following conclusions:

1. The magnetic waves induced in a bar of soft iron by an alternating current differ in form, phase and magnitude from the values assigned to them by any theory of instantaneous propagation.

2. They differ in form, inasmuch as the rise and fall of the magnetic wave is in no case abrupt, but it presents, even for a moderate number of reversals to the second, a perfectly rounded crest and trough, especially at considerable distances from the primary.

3. The magnitude of the wave is constant up to five or six reversals per second, after which it is much lessened; at from 20 to 30 revolutions it diminishes nearly with the number of reversals (the deflections of the galvanometer remaining constant). At from 50 to 100 it falls off rapidly, especially for moderate distances along the bar, being there reduced so as to give one-thirtieth of its former deflection.

4. The phase within the primary is retarded more and more as the rapidity of alternation of the current increases—to a maximum of 90°, and for a distance not too remote is invariably later than it is within the primary.

5. The apparent retardation of the phase depends upon the period (length) of the wave, the arbitrary distance from the primary, the material dimensions and special condition of the bar, and even, in extreme cases, upon the strength and distribution of the magnetic field.

6. The retardation increases for a certain distance (about 30 diameters) to a maximum of from 127° to 130°, or from 37° to 40° later than that of the primary, falling again gradually, at great distances, to 90°, that is, to the original value within the primary itself.

7. The apparent velocity of propagation, accordingly, increases from a moderate value, in parts of the bar not too remote, to infinity somewhere in its central portion, and then descends, with change of sign, for a still further advance in distance, to a minimum, and finally becomes infinite again; so that the most distant portions of the wave reaching their maximum light simultaneously with the nearest, the wave appears to flow backward over the most distant part of the bar.

8. The apparent velocity of propagation over the first 14 diameters is from 25 ft. per second, corresponding to four reversals per second up to 90 ft. for 23 reversals, after which it rises nearly in proportion to the number of reversals, until, for 140 reversals, it measured about 300 ft. per second.

9. The magnetic conductivity of the bar increased (in one case from two to three-fold) under the continued influence of the alternating current sent by a high electro-motive force, whose use in these determinations must generally be avoided.

10. The retardation of phase is less for small rods than for large ones, but in most respects the effects are similar for distances proportional to the relative diameters of the bars.

11. The retardation is less for steel than for iron. With steel, a high electro-motive force may be advantageously employed to overcome the tendency of the magnetic displacements to become permanent.

12. The phase of the magnetic wave may be treated as the resultant of that two sets of waves, one due to the direct (and instantaneous) action of the primary itself, and proportional accordingly to the time and to the inverse cube of the distance; the other depending upon the secondary effect of magnetism already induced in the bar, and hence proportional, more or less, to the square or higher powers of the time, and to the distance as the exponent of a constant factor less than unity. In the same way that each law of magnetic induction has a parallel in the conduction of electricity, it is probable that the law of change in the one is similar to the law of change in the other.

OCEAN METEOROLOGY.—The study of ocean meteorology, which was first successfully undertaken by Lieut. Maury, has been greatly extended in France by M. Brault. His investigations were begun in 1869, upon the basis of exclusively French documents, and they were so successful that, in 1878, he received a prize from the French exposition. His charts of the North Atlantic appeared in 1875 and were presented to the French Academy on the 6th of September. They contain 230,000 observations, both of the direction and of the intensity of the wind. The charts of the South Atlantic appeared in 1876, and those of the Indian and Pacific oceans in 1880. They contain 1,820,000 observations. One of these charts is especially noticeable, that of the summer isanemones or curves of equal wind velocity. They are almost identical with the curve of mean isobars or mean atmospheric pressure. They introduce, for the first time, considerations of the force of the wind at the surface of the ocean, and throw light upon such points as the succession of winds, the ocean currents, the rainfall, the state of the sky and sea, the proportion of tempests and all the principal elements of nautical meteorology.—*Les Mondes*.

The Resemblance of Sound, Heat and Light.

Prof. Tyndall recently gave a course of three lectures on the resemblance of sound, heat and light, in one of which he recurred to the researches of Dr. Thomas Young, as illustrative of the connection which existed between the phenomena of sound and light, the studies of that philosopher on the nature of sound having led up to his parallel studies on the nature of light. The heats in music afforded the most familiar illustration of the interference to which the sound waves are subject. Such a wave consisted of pulsations of rarefaction. If two waves coincide in such a manner that condensation answered to condensation and rarefaction to rarefaction, the sound became stronger, but if the pulse of condensation in the one coincided with the pulse of rarefaction in the other, the sound was neutralized so far, and silence was the result. Experimental proof was given of this periodic reinforcement and extinction of the sound-wave's motion.

It was then also shown by experiment that the phenomenon known as Newton's rings establishes a like periodicity as regards light. Newton's main objection to the undulatory theory of light was that it made the shadows impossible. Newton appealed to the fact of the divergence of the waves in water after passing through an aperture, and Prof. Tyndall thought a like divergence ought to occur in the case of light. It really did occur, as Prof. Tyndall showed by experiment, but the diverging waves obliterated each other according to the demonstrated law of interference.

It was further shown that even in water something of the kind took place. In 1808 an observation of Malus ushered in the darkest days of the undulatory theory. Young himself at first felt that it presented an insuperable difficulty, but he wrestled manfully with it, and waited for more light. As yet the notion was current everywhere that the vibrations of the ether were spread longitudinally, like those of sound. At length the idea of transverse vibrations occurred to Young, and he patiently worked it out, undeterred by its involving the paradox of attributing to the ether the properties of a solid. The same fruitful thought long afterward struck Fresnel, who was then working with Arago. The latter shrank from indorsing so daring an opinion, and that portion of their joint *memoire* was signed by Fresnel alone. In concluding, Prof. Tyndall conducted some interesting experiments, showing that polarization was a phenomenon common to both light and heat.

ACCURACY IN TIME.—The question of accuracy in the matter of time has lately been presented by the American Society of Civil Engineers, in a series of papers embodied in a pamphlet entitled "Standard Time for the United States of America, Canada and Mexico." The plan most favored is that of a series of time meridians, four in number, thus constituting four standards of time on the North American continent. All places less than half way between two of the meridians will take the time of the nearest. It is advised that the first embrace the territory from Nova Scotia on the east to Ohio on the west, and all States lying directly north or south of these. The next would have Indiana and Iowa for its east and west limits. The third would commence with Nebraska and go west to Colorado and Wyoming, while the fourth would include from Utah to the Pacific ocean. These four meridians would form part of a series of 24 extending around the globe, so that this principle could be extended to other countries. The question is also raised whether the day shall not be numbered by hours from midnight to midnight, instead of commencing again at noon. Mr. John Bogart, Secretary of the society, whose office is at 127 East Twenty-third street, New York, will be glad to hear from all who are—from business motives or otherwise—interested in the question of accurate time.

DISCHARGE OF ELECTRICITY BY HEATED BODIES.—It is stated, in *Engineering*, that a burning match or a gas flame acts as a discharger of electricity, this fact having been applied by Sir William Thomson to his portable electrometer in observing the potential of the atmosphere at any point. Recent experiments by Prof. Guthrie have shown that an incandescent platinum wire also acts as a discharger of electricity, displaying a preference for discharging a negative rather than a positive charge. If a platinum wire, made incandescent by an electric current, is placed between two gold-leaf electroscopes, one charged with positive and the other with negative electricity, it will be found that the negative charge is rapidly drawn off, while the positive charge remains almost unaffected. The wire in this experiment was at a dull-red heat, and it is probable that a higher temperature would also have affected the discharge of the positive electricity. Prof. Guthrie likewise shows that a red-hot metal ball at certain high temperatures will not accept a charge of positive or negative electricity from the conductors of a glass electrical machine, while at certain lower temperatures it will accept a negative charge, but not a positive one, and at still lower temperatures it will take both a positive and negative charge.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending May 4.		Week Ending May 11.		Week Ending May 18.		Week Ending May 25.	
Alpha	1.15	1	10c	....	50c	....	....	....
Alta	2¼	1.95	1.90	1.45	1.55	80c	1	80c
Andes	70c	65c	70c	60c	60c	40c	50c	45c
Albion	2.15	2.05	1.95	1¼	1.95	1½	1½	1.60
Argenta	....	....	10c	5c	15c	10c	15c	....
Addends	....	....	....	....	....	....	....	....
Belcher	55c	40c	40c	20c	45c	25c	30c	....
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	5¾	5¼	5¾	5¼	5¼	1.10	4.95	4.15
Bullion	40c	20c	30c	....	30c	25c	25c	20c
Beehtel	30c	....	30c	25c	30c	25c	15c	....
Belle Isle	....	....	....	....	....	....	10c	....
Bodie	5¼	5¼	5¼	5¼	5¼	5¼	5¼	5
Benton	60c	50c	50c	45c	45c	35c	30c	....
Bulwer	2¼	2.20	....	....	2.10	....	1.95	....
Boston	30c	20c	....	....	....	....	20c	....
Back Hawk	10c	....	....	....	....	....	10c	....
Bodie Tunnel	....	....	....	....	1.20	....	1.10	1.05
Booker	....	....	....	....	....	....	....	....
Caledonia	....	....	....	....	....	....	....	....
California	30c	25c	25c	20c	25c	15c	20c	15c
Challenge	25c	20c	....	....	....	....	....	....
Chollar	85c	75c	60c	45c	55c	25c	40c	35c
Confidence	80c	....	80c	70c	70c	65c	6oc	50c
Con Imperial	....	....	....	....	....	....	....	....
Con Virginia	70c	65c	65c	6 c	60c	40c	50c	40c
Crown Point	70c	65c	60c	50c	55c	40c	40c	....
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1½	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	1.80	1.65	1.90	1.70	1¾	1.30	1.95	1.85
E. Mt. Diablo	10c	....	10c	....	10c	....	10c	....
Eureka Con	22½	21¼	21¼	21	19¾	19	18¼	16¼
Eureka Tunnel	....	....	....	....	75c	60c	55c	....
Exchequer	25c	....	25c	....	20c	10c	15c	10c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	....	....	15c	5c	10c	5c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	50c	45c	35c	....	25c	....	25c	20c
Gould & Curry	2.85	2.35	2.35	2.20	2.40	1.60	1.80	1.60
Hale & Norcross	1.55	1.30	1.30	1.10	1.35	60c	70c	30c
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	....	....	10c	....	10c	....	10c	5c
Justice	55c	40c	40c	30c	35c	25c	25c	10c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	40c	....	25c	....	25c	....	15c	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	10c	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Bells	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1¼	....	1¼	....	....	....	....	....
Martin White	....	....	4.30	4.05	3.90	3¾	3½	....
McClinton	....	....	....	....	....	....	....	....
Meno	1.69	1.35	1½	1.20	1.30	1.10	1.15	....
Mexican	8¼	7¼	7¼	6¼	6¾	4.95	5¾	4¾
Mt. Diablo	4¼	4	4.10	3.85	3.80	3.60	4	....
Mt. Potosi	....	....	....	....	60c	5c	40c	....
Noonday	1.05	1	....	90c	....	90c	....	85c
New York	....	....	....	....	5c	....	....	....
Northern Belle	8	....	8	7¾	6¼	4¼	7	6¼
North Noonday	1	90c	1	95c	1	95c	1	....
Navajo	1.55	1.35	1.60	1.45	2	1.80	2¼	2.10
Occidental	85c	....	....	....	50c	....	50c	....
Ophir	4¼	3.70	3¾	3¼	3.35	2.55	2.60	2.45
Original Keystone	....	....	....	....	....	....	....	....
Overman	25c	10c	15c	10c	15c	10c	5c	....
Oro	30c	25c	25c	....	20c	15c	15c	10c
Paris	....	....	....	....	....	....	....	....
Potosi	70c	50c	35o	25c	75c	25c	55c	45c
Pinal	....	....	....	....	2½	2¼	3	2.90
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.55	1¼	1.65	1.10	2.10	80c	90c	55c
Seg Belcher	2¾	....	....	....	5	....	2	....
Sierra Nevada	9¾	8¼	8¾	6¼	6¾	5	6	5¼
Silver Hill	....	....	10c	....	....	....	10c	....
Silver King	17⅝	17¼	18¼	18	18	17	17¼	16¾
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	1	85c	80c	70c	80c	60c	75c	65c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	25c	....	....	....
South Nevada	....	....	....	....	7¼	6¾	6¾	6¾
Syndicate	....	....	....	....	....	....	15c	....
Tioga Con	25c	....	....	....	15c	....	15c	....
Tiptop	....	....	....	3¾	....	3.20	3	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	11¾	12	12¼	10¼	10¾	8¾	10¼	9
Utah	5	4¼	3	2.40	2.65	2	2.30	2
Ward	....	....	3¼	....	....	....	3¾	....
Wales	50c	....	50c	....	....	....	4 c	40c
Yellow Jacket	1¼	1.15	1	90c	95c	60c	75c	65c

Sales at S. F. Stock Exchange.

Thursday A. M., May 25.

650 Alta.....80c
20 B & Belcher.....4¼
200 Chollar.....35c
300 Con Virginia.....45c
210 Gould & Curry.....1.70@1.65
140 Mexican.....5¾
100 Northern Belle....6¾@6¾
70 Ophir.....2.80
200 Potosi.....35c
170 Savage.....60c
540 Sierra Nevada.....5¾@5¾
130 Utah.....2
1010 Union.....10@9¾

AFTERNOON SESSION.

50 Argenta.....15c
600 Atlas.....50c
330 Bodie Tunnel.....1.15
600 Belle Isle.....10c
260 Bodie.....5
100 Bulwer.....2
200 Concordia.....1
490 Day.....1.95@1.90
1000 Grand Prize.....5c@10c
500 Independence.....10c
200 Mt. Diablo.....4
500 M White.....4
200 Navajo.....2.15
400 Noonday.....95c
70 N Noonday.....95c
100 N Belle Is.....10c
300 Oro.....15c
50 Southern Nev.....6¾
60 Silver King.....17

Bullion Shipments.

We qnote shipments since onr last, and shall be pleased to receive fnrther reports:

Betty O'Neal, May 10th, $5,188; Contention Con., 16th, $12 815; Christy, 17th, $2,143; Standard Con., 16th, $66,426; Alice (for April), $90,000; Homestake (for April), $113,800; Deadwood Terra (for April), $58,600; Horn Silver, May 19th, $10,000; Bullionville, 19th, $1,613; Alladin (Brigham, Utah), 19th, $4,300; Bodie Tnnnel, 23d, $3,723; Betty O'Neal, 22d, $4,481.66; Eureka Con., 19th and 20th, $9,186 99; Christy, 23d, $2,260; Contention Con., 20th, $15,940; Silver King, 14th, $11,800; Northern Belle, 18th, $6,295 66; Star, 19th, $1,324 29; Bodie, 22d, $9,590; Christy, 22d, $2,122; Contention, 16th, $12,815 34; Eureka Con., 17th and 18th, $7,670.67; Germania, 18th, $3,500; Hanauer, 19th, $2,100; Horn Silver, 19th, $22,500; Frisco, 19th, $9,487; Gillespie, 19th, $2,650; Mammoth, 18th, $1,200; Horn Silver, 18th, $12,500; Barbee & Walker, 19th, $1,212.

THE Winnemncca reduction works have been started np. The machinery has been overhanled and thoroughly repaired, and everything ahont the premises is now in first-class order. A new smoke-stack, taller than the old one, has been put in the mill.

THE Sntro tunnel discharges 5,868,150 gallon of water in 24 honrs.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	No.	AMT.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Argenta M & M Co	Nevada	10	10	Apr 12	May 19	June 12	E M Hall	327 Pine st
Alta S M Co	Nevada	23	50	May 2	June 6	June 27	W H Watson	302 Montgomery st
Boston Con M Co	California	3	20	May 23	June 28	July 20	F F Luty	340 Pine st
Belcher S M Co	Nevada	30	25	Apr 14	May 17	June 5	J Crockett	327 Pine st
Belvidere M Co	California	13	25	Feb 9	Apr 12	June 8	C V D Hubbard	310 Pine st
Best & Belcher M Co	Nevada	23	50	Apr 5	May 11	June 2	Wm Willis	309 Montgomery st
California M Co	Nevada	3	20	Mar 29	May 6	June 5	G F Gordon	309 Montgomery st
Chollar M Co	Nevada	8	25	May 9	June 12	June 30	W E Dean	309 Montgomery st
Excelsior Gray M Co	California	18	25	May 4	June 6	June 23	D E Chisholm	327 Pine st
Fair Villa M Co	Arizona	1	2½	Apr 24	May 29	June 19	J H Sayre	330 Pine st
Gould & Curry S M Co	Nevada	42	50	May 23	June 29	July 21	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	74	50	May 16	June 20	July 11	J F Lightner	309 Montgomery st
Justice S M Co	Nevada	36	50	May 22	June 27	July 18	R E Kelly	419 California st
Martin White M Co	Nevada	12	25	May 9	June 20	July 20	J J Scoville	309 Montgomery st
Napoleon M Co	California	8	5	Apr 20	June 1	June 19	H Smith	307 Montgomery st
Overman M Co	Nevada	53	25	May 1	June 6	June 27	G D Edwards	414 California st
Pinal Con M Co	Arizona	3	30	Apr 3	May 8	May 29	W W Traylor	309 Montgomery st
Potosi M & M Co	Nevada	8	50	Apr 12	May 16	June 6	W E Dean	309 Montgomery st
Quartz Moutain M Co	California	14	75	Mar 16	May 24	June 24	E Hestres	729 Montgomery st
Savage M Co	Nevada	51	50	May 4	June 6	June 26	E B Holmes	309 Montgomery st
San Pedro G & S M Co	Nevada	5	10	May 10	June 12	July 10	W G Holmes	Sherman's Building
Sierra Nevada M Co	Nevada	73	1 00	May 17	June 21	July 10	E L Parker	309 Montgomery st
Silver Lick Con M Co	Nevada	1	05	Mar 29	May 6	May 27	L J O'Farrell	Montgomery Block
Silver Hill M Co	California	2	25	Apr 12	June 10	July 10	J W Pew	310 Pine st
Villagrana M Co	Lower California	1	20	Apr 25	June 26	July 15	A Judson	320 Sansome st
Utah S M Co	Nevada	29	1 00	May 4	June 10	June 29	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Belle Isle M Co	Nevada	4	10	May 23	June 23	July 17	E M Hall	327 Pine st
Caledonia M & M Co	Nevada	12	25	Apr 5	May 18	June 15	W Letts Olliver	323 Montgomery st
Golden Fleece Gray M Co	California	25	30 00	Apr 15	May 20	June 8	F Schirmier	7s5 Fo som st
Grand Prize M Co	Nevada	8	10	May 2	June 5	June 26	E M Hall	327 Pine st
Holmes M Co	——	4	10	Apr 4	May 8	May 29	E A Holmes	318 Pine st
Lima Con M Co	——	4	05	Mar 31	May 5	May 31	R D Hopkins	436 Montgomery st
San Pedro G & S M Co	California	5	10	May 10	June 12	July 10	W G Holmes	Sherman Building
Santa Annita M & M Co	California	3	03	Apr 17	May 22	June 12	J M Buffington	309 California st
South Hite G M Co	Cal fornia	4	10	May 3	June 5	June 28	F A Berlin	420 Montgomery st
Tower Con M Co	Nevada	1	10	Apr 7	May 12	June 1	G W Sessions	309 Montgomery st
Western Home M Co	——	3	05	Apr 10	May 11	June 15	A Halsey	323 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Excelsior Gray M Co	California	D B Chisholm	327 Pine st	Annual	June 4
McElroy Gray M Co	California	L Lillie	607 Washington st	Annual	June 6
Silver Hill M Co	California	W E Dean	309 Montgomery st	Annual	May 26
Tilden M Co	——	C Van Dyck Hubbard	310 Pine st	Annua	June 9

LATEST DIVIDENDS—WITHIN THREE MONTHS

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	May 12
Contention M Co	——	D C Bates	309 Montgomery st	25	Feb 28
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	Apr 22
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Apr 11
Silver King M Co	Arizona	J Nash	315 California st	25	Apr 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	May 12

The Mining Share Market.

There is not much to say concerning mining shares. The market is still quite dnll.

The speed of the Union pnmp has been increased hnt one stroke since the water came in at the end of the main north drift on the 2500 level of the Sierra Nevada mine. It is snpposed that the report of there having occurred a second flood evening before last had no other fonndation than that some one observed a hailing tank being used at the Union shaft. This tank was merely pnt on temporarily while a pnmp clack was being changed.

The flow of water in the drift is of an intermittent character. At times it is very small, and again it is almost as great as at first. This is snpposed to be owing to the fact that the crevices throngh which it flows at times become clogged with sediment, which finally gives way nnder an increased pressnre.

A hnlkhead has been placed across the drift, which prevents this sediment from flowing down to the shaft and into tbe sump. The water interferes with no work in the north end mines, except at the face of this particnlar drift. As it is water that wonld nndonhtedly have been tapped further along, the sooner it is ont the hetter.

The *Enterprise* says: On reflection dealers in stocks will find that there is nothing to cause any alarm. The worst featnre on the Comstock to-day is one that conrage might remedy in a very short time. This is the allowing of so many of the mines at the sonth end of the lode to lie idle and water-logged. This is a sort of standing damper on the whole Comstock.

Why it shonld effect the north end mines, nearly a mile away, it is hard to see. Yet, it evidently does, and also there appears to he in the minds of many a sort of prejudice against the leading north end mines, or a suspicion that there is some kind of trickery ahont the developments made and making in Union, Mexican and Sierra Nevada. We venture to say that had the eight-foot streak of rich ore cut on the 2,600 level of the Union Consolidated—and which was hardly looked at there—heen cut on the 2,400 level of the Savage, the stock of that mine would have bonnded np to $20 or $25 per share. Why this rich streak of ore is not as good for Union as it wonld have been for Savage we oannot see.

At the Union they have now commenced hreasting ont and pntting up sqnare sets 50 ft. helow the 2,500 level, and the ore is opening np splendidly. They now see hefore them in that one spot ore enough to insure the present weekly yield for two months to come. Meantime it will be strange if they do not open up deposits at other points. The rich streak on the 2,600 level has not yet heen touched. There is a 10-ft. streak (containing mnch good ore) on the 2,500 level, ahont 200 ft. sontheast of the present stopes, which has not heen touched. On the 2,800 level they are raising for the deposit ont throngh hy the joint Union and Sierra Nevada winze some months agu, and are already finding streaks of ore from 6 to 12 inches wide. There are excellent indications of ore in the northeast drift on the 2,600 level, and this will probably be fonnd when least expected.

TUSTIN'S PULVERIZER.—W. I. Tustin's ore pnlverizer, which we not long since illnstrated and described in detail, has heen in nse for some 15 months, and is as nearly mechanically perfect as possihle. He has sent one recently to Nevada City, to be used at Maltman's reduction works, and is now hnilding another to order. The Hoffman Bros., who are nsing it in this city, say: "Dnring the 15 months which we have had yonr pnlverizer in our establishment, we have snbjected it to many fair and thorongh trials, and in each and every instance it worked to onr entire satisfaction, and far exceeded any machine we have ever used in pulverizing ores. As we receive ores from all parts of the conntry, we have every and ample opportnnity to test it on all kinds—hard and soft—and always fonnd it meeting our expectations. Even on manganese ore, the terror to all pulverizes, stamps and Bnhr mills, it worked with a No. 40 mesh screen at the rate nf 7 tons in 24 honrs. Another feature of great merit in your machine is the fact that on all rich ores which contain more or less native or virgin metal it acts as a perfect dry concentrator, as it discharges all the fine ore and small pieces of metal throngh the screens and retains the pure bnllion, which can easily he extracted hy removing one nf the small plates and allowing the machine to make a few revolntions. The small amount of power it reqnires to work it is one of its main points, as ahout one and one-half horse power was fnund to he more than sufficient on the very hardest ore to which it was snbjected."

WATER WHEELS.—A correspondent of the Amador *Ledger*, writing from Sntter Creek under date of May 17th, says: There has been mnch talk ahont the relative merits of rival water-wheels, bnt there is nothing that tal s so potently and effectively as actnal test. This test has lately heen made at the Keystone mill, and has proved the superiority of the famous Knight's wheel heyond the possihility of cavil. The fnll particnlars of this interesting trial of strength yon will no donht publish hereafter, as a matter of general importance to the mining community. I may here state, however, that several weeks ago Knight's wheel, which had been nnnning the mill for years, and had given entire satisfaction, was taken ont in order to try a wheel invented by I. Lepley. This wheel proved a failnre, and was discarded. Next Donnelly's wheel, for which a patent was secnred recently, was pnshed to the fore. This, it was londly claimed, conld heat the Knight wheel. So a trial was made of it, resulting in its being proved far inferior to the Knight patent. Every device was resorted to in the hope of coaxing the thing to do the required amount, bnt to no purpose. Saturday morning the attempt was ahandoned as a failnre. The Knight wheel was pnt back, and has been nnning the works as smoothly and economically as heretofore. The chances are slim indeed of its being taken from its post of dnty again in order to experiment with untried machinery.

FRUE CONCENTRATORS.—E. L. Montgomery, Snperintendent of the Amador Pacific G. M. Co., Plymonth, Amador connty, says that the 16 Frne concentrators in that mill, which have been running since February, give entire satisfaction. He says: They are the hest concentrators for snlphurets in nse. Wonld not want to do without them in any gold mine.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

CALAVERAS.

CLEAN-UP.—*Mountain Echo*, May 17: Findlay & Co. cleaned up $400 the other day, the yield of 18 tons of ore taken from a 7-ft vein in the Dock Hill mine.

MISCELLANEOUS.—The Big mine, nwned and worked by Potter & Co., never looked better than at present. The lead continues from 12 to 15 ft wide and yields about $16 a ton....J. T. Curtis recently sold his quartz mins in Salt Spring valley to an Eastern company for the sum of $3,000. The lumber and machinery for erecting a new mill are now on the ground, and the company intend to have the mill in operation the first of June....Leeper, Keyes & Co., intend to commence sinking a shaft on the Invincible mine in a few days. It is their intention to sink at least 150 ft deep. Their success will depend mainly upon their own efforts, as this mine is known to be ons of the richest on our great mineral belt....Lindsay & Co. are making rapid strides in the way of developing their mine. Within a few weeks they bave driven the tunnel over 40 ft ahead, and bavs already discovered some good ore. It will require several months to reach the main works, but when once reached they have the most positive assurance of a goldon harvest.

GOLD CLIFF.—Everything is in splendid working order at the Gold Cliff mine. A new track has been laid from the mins to the mill, which will naturally curtail the expense of conveying the ors to the works. Heretofore it has been necessary to convey the ors a part of the way in wheelbarrows, but the new track will obviate this useless expenditure. The mill has been repaired and everything is in readiness to rs nme operations.

LETTER FRBM MURPHY'S.—We are on tbs eve of another exciting quartz boom of hugs proportions. An incsntive has been given prospectors by the recent strikes that revives the latent spark of hope that had almost become extinct in the old stand-by's, and inspired them to renswed exertion for their prospective pile. Since my last, I have to report anotber very rich strike in the Mayflower, a mine recently opened by Sublett & Dodge, and supposed to be an extension of the O. K. The vein is small but very rich; $50 per day has been pounded ont of it for the last three days of last week, in a hand mortar, besides accumulating several tons of high-grade ore on the dump. This vein is located on Buckhorn Ridge, and is nno of the group mentioned in my last letter. There was a run maas of 30 tons of rock from the O. K., one of the group also, in Moss & Stone's mill last week, and the snug sum of $500 taken out. This is over $16 per ton without the sulphurets. The next crushing from this group will be 50 tons from the Banner, owned by Sentar, Sublett & Co. Good returns are expected from this rock.

EL DORADO.

THE BENFELDT MINE.—*Mountain Democrat*, May 19: Fred Benfeldt is still putting in big licks at his gravel mins near Smith's Flat. He is still breasting, and is now in 86 ft, and still no sins of the rim, thus showing that the width of the channel far exceeds his expectations. He is working 10 men now, and his clean-up last week realized something over $3,000. Some of the cement that he is taking out is literally filled with coarse gold, presenting a most bewildering pepper-and-salt appearance.

THE STRIKE.—Georgetown *Gazette*, May 20: The strike we spoke of last week was made by T. Z Armstrong and A. Baldwin on the Rich gulch seam mine south of town. They took out nearly $3,000 last week, and it is still yielding good returns. The mine has yielded fully $8,000 since the 1st of last month.

A STRIKE of considerable importance has been made this week on a quartz mine 2½ miles southwest of Georgetown, owned by Sam Collins and two other gentlemen whose names we have not learned. They have been sluicing with good prospects, and came upon a vein of quartz 12 to 18 inches in width, which is well filled with gold. They have taken out a goodly lot of handsome specimens, and work on the veiu so far shows no signs of the gold giving out.

INYO.

THE O. L. M. & M. CO. MILL.—Inyo *Independent*, May 20: Since the loss of the Bessie Brady, Supt. Wheeler has hnd: up the stamps of the Hawley mill until a supply of wood can be got down from Cerro Gordo, which he has contracted for. The mill had worked 136 tons of Palma ore, but what results we are not informed. Supt. Keeler has his men engaged repairing and increasing the capacity of the old barge, with which will he tried the experiment of getting the wood supplies across the lake.

MARIPOSA.

HORNITOS.—Cor. Mariposa *Gazette*, May 20: Times are looking mors prosperous in the way of mining matters than they have been for years in this section of country. A great many had predicted a failure in the mines in this section after the old Washington mine was closed; and, indeed, it was a sad blow to a great many. But Mr. Hullings has come to the rescue, and is making the mining interest look up. The Yosemite, or No. 9, has been increasing her yields every clean-up, showing that she only needed to he in the proper hands to be one of the first veins of the State. Work has just been commenced on the Pool mine, which Mr. Huling has just purchased at a large price. So far as developed it looks well, and bids fair to be one of the best mines in the State. The rock looks and prospects well, and shows considerable free gold in the hard rock. Steam hoisting works will be put up just as soon as they can be had from below. The Mount Ophirs mine, after having sunk a perpendicular shaft of over 90 ft through blue granite—the hardest rock in the country—was stopped for a few weeks, all work was suspended except the pumping, which has been going on in order to drain the old works. Work will be resumed in a few days, and pushed forward with all possible speed.

MONO.

CROWDED.—*Homer Mining Index*, May 20: Lundy is crowded with strangers and returning old timers to such an extent that the present capacity of our lodging-houses is inadequate for their accommodation. A new mining district has been organized at Death valley, with Judge Calif, formerly of this place, as Recorder. Some of the ledges are reported as being 60 ft or 70 ft wide. Six Burleigh drill miners went over to Tioga, on Thursday, to go to work for the Great Sierra Co.—3 of them heing from Butte City, 2 from the Comstock and 1 from Eureka. All the old timers are coming back to Lundy in anticipation of the boom, which will strike here as the summer wears on. The shaft of the Josephine has been substantially timbered sinking has been resumed and the vein matter is improving in aspect.

NEVADA.

EMPIRE.—*Tidings*, May 19: The Empire mine is looking exceedingly well, the ledge improving as depth is attained. The 13, 11 and 10 levels are looking well, each containing a good ledge, while the 9, 8 and 5 levels are not looking bad. The Empire Co. will soon open up the old Rush & Laton ground, and the machinery from the Rich Hill ground will be placed upon the new ground as soon as possible.

REPAIRS.—Repairs on the O'Connor are going steadily forward. The hoisting works will be ready in a day or two. The tributers are industriously working, taking ont quartz to be crushed as soon as the mill is completed, which will be but a short time. Mr. Clark informs us that it will probably be some time before the Menlo Co. resumes operations. The affairs of the company, however, will be straigbtened very shortly.

IDAHO.—It will be about 5 months before the 14 level in the Idaho is opened up. There is a splendid ledge in the 12 and 13 levels, which gives the Messrs. Coleman en-

encouragement to keep going down. The yield this month will be a large one.

NEW YORK HILL MINE is looking up. The directors of this mine feel greatly encouraged at the present appearance of the mine. Sinking and taking out rock on tribute, is being done at the mine. There has been no news received here for some time regarding the Scotia. The probabilities are that a number of mines on Massachusetts hill and surrounding country will start up during the coming summer.

THE bonanza of the Ford & Mullen is looking as well as ever. Good rock is now coming out of the mine. The last rock crushed paid considerably over $200 to the ton.

THE IMPERIAL CO are still sinking on their ledge, and the best kind of indications for a valuable mine are in sight. Rock recently taken out is now being hauled to a custom mill, and will be crushed some time during the coming week. The Imperial has put on an extra shift of miners, and is now working day and night.

THE WASHINGTON is looking very favorable, the ledge improving in character as it is opened up. The present indications are that a large ledge will be reached in due time. There is a large stream of water coming from the ledge.

WORK has been suspended for a short time on the Cold Point. The probabilities are that a 20-stamp mill will soon be erected upon this property. The ledge is large and of good quality.

THE MENLO.—Grass Valley *Union*, May 13: Mr. Atherton Clark, who has been connected with the Menlo Mining Co., of this place, and who has been conducting the affairs of the company here, left yesterday evening for the East. Mr. Clark says that his company by no means intends to abandon work here, and it is quite liable that work on the company's mines here will be started up again during the summer. The company has great faith in the mines under its control, and it is certainly to be hoped that work will again be started up on the Homeward Bound and Pennsylvania claims.

A GOLD-BOUND BOWLDER.—Nevada *Herald*: There was found in the China diggings at Moore's Flat, on Saturday, a quartz bowlder, weighing 85 lbs., which our informant says is quite a curiosity. The rock is egg-shaped and extending nearly around the center of it is a band of leaf gold. The band is not regular in size, in some places being nearly an inch wide, and in others reduced almost to a thread. The bowlder looks as though it had been rolled over a large streak of gold and some of the precious metal had adhered to it. Whether the gold extends through the rock is not known, as it has not yet been broken open. Several who have viewed the specimen estimate that there are 10 lbs. of gold in it, but this is mere guess-work. The rock is on exhibition at Hegarty's store, Moore's Flat.

CONNECTION MADE.—Nevada *Herald*, May 20: The work of running a tunnel from the Wyoming mine to connect with the incline of the Nevada City mine, for the purpose of furnishing the latter with an outlet through which to drain has been completed. The connection was made a few days ago. The tunnel was driven from both mines and taps the Nevada City at the 350 level, to which point the water will be pumped and then flow through the drain tunnel, which is over 3,000 ft in length. The grade of the tunnel will have to be changed a little, near where the connection was made, when it will be ready for service. By this arrangement less power will be required to keep the mine free from water, and as soon as the pipe is finished and put in place, the hoisting works, pumps and quartz mill will be run by water power instead of steam. The running expenses of the mine will thereby be reduced considerably.

PLACER.

CRAVEL.—*Placer Argus*, May 17: The Morning Star gravel claim, at Iowa Hill, is being diligently worked by the company, and they have the very best prospects ahead. At the start it was worked by drifting, then the hydraulic process was resorted to, but the cement proved to be too hard for this mode of work, and now the company are drifting again. A tunnel has been run and an upraise made which has reached good pay gravel. A 10-stamp mill has just been completed and will soon start to work crushing the cement and gravel. John C. and Edward Coleman, of Grass Valley, and J. H. Neff, of Colfax, are the principal owners.

AN IMPORTANT STRIKE.—Placer *Herald*, May 20: Robt. Lewis, of Damascus, and one of the standbys of that section of the county, after working against more or less adversities for some 2 years in driving a tunnel into the side of the mountain, has at last struck the channel, we are informed, and has every prospect of a permanent and rich drift mine. Mr. Lewis was confident all the time that there was a channel ahead, and his hard work has demonstrated the correctness of his theory. There is no more deserving man anywhere than Mr. Lewis, and we share in the joy he undoubtedly realizes in his success.

PLUMAS.

BUTTE BAR ROCK.—*National*, May 13: Mr. Masten, one of the gentlemen who owns and works the Butte Bar ledge, sent us a couple of specimens from his mine this week, which will compare well with anything we have seen. Assays from this rock go as high as $9,500 in gold and silver. The ledge is a large one and will undoubtedly prove very valuable, when fairly opened and worked. It is one of the most inaccessible places in the county, on the Middle Fork, and about south of Buck's ranch, but a wagon road can easily be built to it, and before the season is over we hope to record the fact that a mill is at work there. It is certainly a valuable mine, and the owners should develop it as soon as possible.

MOHAWK ITEMS.—Our correspondent tells us that the King and Nesemen boys are taking out big pay in their mine near the valley, and report says they have cleaned up over $4,000 so far this season..... Mr. Culver started for San Francisco a few days ago, for medical treatment..... Hapgood, Bisbop & Co. are fitting up their gravel claims..... Burge & Goegle have their claims in good shape, and will start up in a few days.

MONTE CRISTO.—Mr. D. J. Mahoney, of the Monte Cristo mine, was in town on Wednesday, and reports everything moving along in good shape. The gravel improves as the tunnel progresses, and a full force of men are driving the work ahead as rapidly as possible. The snow still shows up on Spanish Peak, and the spring season is late up here.

ANOTHER GOOD MINE.—We are informed that a mine recently opened by Tom Davis, of Crescent, and T. F. Emmons, of Greenville, and located near and above the Green Mountain mine, is showing some very fine rock and paying handsomely. They have four stamps at work, and the chances are good that a very valuable property will yet be developed by their operations.

ROADS OPEN.—Greenville *Bulletin*, May 13: The road to the Plumas National mine is now open, and that to Gold Stripe was open a week ago. It is certain that crews of men will soon be at work on both these mines.

GOLD STRIPE MINE.—The Gold Stripe mine and mills are now ready for work. The ground has dried out and become solid enough for hauling. Some repairs must first be made on the roads where they have been washed out. The mills will be started up on the first of June.

DIXIE CANYON MILL.—The Dixie Canyon mill is now running on ore belonging to Messrs. Emmons & Davis. The mine is known as the Altona. At present the ledge is from 3 to 4 ft wide, and improves in width and richness as depth is gained. One hundred tons of ore will be crushed during the present run.

OREGON MOUNTAIN MINE.—Since the mills of the Green Mountain mines have resumed work the reports of the New York Mining Stock Board show an increase in the value of the stock. This confidence in the value of the mine is well founded. During the past month the mills have been running steadily and the shipment of bullion has been heavy. Beyond question the mine will soon be paying dividends as usual.

SHASTA.

FRENCH GULCH.—Shasta *Courier*, May 20: We understand that Johnny Coyle, at the Center, is going to rush things in his claim this summer, and will employ a force of 20 men. Wm. Murray was down from Flat Creek, Friday, and tells us that they have struck it rich again in the Dent, Young & Murray claim.

SIERRA.

A BIG LANDSLIDE EXPECTED.—Sierra Co. *Tribune*, May 18: The Boston Hydraulic Mining Co., of Moore's Flat, discharged the men last week that were recently put to work in its claim. This was done from the fact that there were indications of a large landslide occurring—such as the one that filled up the claim last year. It is said that the company will suspend operations altogether. If this is true, it will prove a terrible blow to Moore's Flat.

VIRGINIA GRAVEL CLAIM.—D. Cross, who has the Virginia mine, at Howland Flat, leased, is working the claim on an extensive scale. He is employing 50 men, and under his supervision the mine is yielding profitable returns.

LARGE DIVIDENDS.—It is said that the Marguerita quartz mine at Sierra City is paying $10,000 per month above all expenses of working it. This is only one of Sierra county's rich mines.

A NEW ROAD.—The Rainbow Mining Co. will commence grading a wagon road in a few days from Alleghany to Kanaka creek, where the quartz mill is to be erected.

THE OUTLOOK OF SIERRA COUNTY.—As spring opens there is beginning to be very hopeful inquiry continued by would-be investors from the East for legitimate mines. Among them perhaps none are coming to more prominence than the location lying east of this place, known as the Wallis Con. property. It is generally understood that an ample working capital will be shortly forthcoming to develop it. As the matter involves no sale or speculations other than bona fide investment and development, with liberal terms to those who put up the money, together with the high esteem in which the property is generally held, there seems no reason why the scheme should not be a success. As a test of the ridge to the east, ranging some 14 miles in distance, it will be invaluable to other locations and properties; and should it result in a success, as we doubt not it will, a new impetus will be given to our mining industries, at once warrantlug the best hopes, and in every way satisfactory.

AN EXTENSIVE ENTERPRISE.—The owners of the Marguerita mine, at Sierra City, are engaged in making a survey for a tunnel to be run in the ridge for the purpose of tapping the Keystone ledge. There are also in the same course 5 well-defined ledges, all of which prospect well in the croppings. The Keystone was a big paying mine a few years ago. It was worked as deep as possible by tunnels, when a shaft was sunk to quite a depth from the face of the lower tunnel, the mine yielding largely at that time. But owing to the difficulty of securing pure air so far under ground and the large amount of water that was necessary to contend with, the owners, who had already made their fortunes, suspended operations. The proposed tunnel will tap the ledge of this mine (at a rough estimate) in about 4,000 ft. This is a big undertaking, and if it is pushed ahead to completion, Sierra county will surprise the outside world as to her wonderful mineral resources.

THE BONANZA DRIFT CO.—The Bonanza Co., at Howland Flat, is still pushing operations in its claim. Fifteen men are employed at present in running gangways and tunnels. The main channel was lost soon after the company had purchased the mine, but the outlook is very encouraging for again striking the lead at an early date.

OPERATIONS TO BE RESUMED.—The Martine quartz mine, located near the Keystone and owned by residents of Sierra City, will soon be in full blast. Supplies are being shipped to the claim, and work will be pushed this season. Enough ore has been extracted to satisfy the owners that they have a good mine.

NOTES.—*Mountain Messenger*, May 20: We learn that the One Thousand and One gravel mine, above Sierra City, has gravel that prospects 25 cents to the pan. The company is now trying to follow the pay gravel that was found several years ago..... Red Dog gravel claim, between Monte Cristo and Downieville, S. Baker, Gen. Davis and A. Cregnon, owners, yielded last week 17 ounces of heavy lead gold. Abundance of pay gravel ahead. ..... Supt. Deidesheimmer, of the Marguerita quartz mine, left for Virginia, Nevada, last Tuesday. This property now bids fair to become a permanent and remunerative investment for its lucky owners.

RUBY.—The Ruby Co have not yet found the lead, and we understand that it has been decided to come back 1,200 ft in the tunnel and raise up, with the expectation of striking the Bald Mountain lead.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.—*Enterprise*, May 20: On the 2500 level No. 2 winze has been sunk and timbered 9 ft. The main north drift has been extended 15 ft and work suspended for the present, on account of a considerable flow of water appearing. This water is now steadily decreasing in volume and does not interfere with other workings in the mine.

ALTA.—We are now hulkheading the east drift, which I find necessary to guard against flooding, as our pumps and tank are doing all they possibly can do, consistent with safety. Rock hoisted, 420 cars, wood consumed, 110 cords; strokes made by pump, 18,982.

UNION CON.—On the 2500 level are stoping out ore. On the 2600 level the northeast drift has been extended 32 ft. A north drift has also been started on this level. During the week 562 tons of ore have have been extracted from the 2500 level, and 413 tons and 1,380 lbs of ore have been sent to the mill. During the week bullion to the value of $24,600 32 has been shipped.

YELLOW JACKET.—The work of reopening the old levels from the Winters shaft continues. This work is necessary now, as we find the stations and drifts caved full, it requiring nearly as much labor as to run new drifts.

CALIFORNIA.—The south lateral drift on 2700 level has been advanced 34 ft. Joint consolidated east drift No. 2, on the same level, has been extended 18 ft.

BELMONT DISTRICT.

OVERHAULING.—Belmont *Courier*, May 18: The work of overhauling the Monitor-Belmont mill is going on at a lively rate; many improvements have been made since it shut down, and when completed it will undoubtedly be one of the best reduction works in this part of the State. The two new furnaces are now on the way from Lyning, and immediately after their arrival here they will be put in place. It is thought that the mill will be ready to start up early next month. ..Mr. Emerson's mill started up on Wednesday. The machinery works like a charm, but the steam supply proved to be inadequate. The engineers are now engaged in making some improvements, and when these are completed the mill will again be started on ore from Mr. Emerson's mine.....As we will soon have two mills running in Belmont, mine owners and chloriders should go to work and extract a few tons of ore from Mother Earth.

BRISTOL DISTRICT.

TAILINGS.—Pioche *Record*, May 13: The mill of the Bristol S. M. Co., which started up a week ago on tailings, closed down again on Wednesday, owing to the tailings not paying. The roaster is now being repaired, and after it is repaired the mill will be put to working ore again.

DAY CO.—At the furnace 4 men are engaged in completing the repairing that has been going on. In the Day mine prospecting is being vigorously pushed, and some of the greatest work ever done in a mine on this coast has been done by the company during the past 4 months. At the Meadha the same vigorous prospecting is being carried on as at the Day.

CHERRY CREEK DISTRICT.

ON THE LOWER LEVELS.—White Pine *News*, May 20: The Star folks reached the north vein on their new level Wednesday afternoon. We hear, but from no authentic authority, that good ore, giving assays of over $100 to the ton, has been met with. It will, however, probably take several days to determine the real bulk and value of the ore on the new level.

COLUMBUS DISTRICT.

MOUNT DIABLO.—*True Fissure*, May 20: Winze No. 1 on the third level has been sunk 14 ft since last report, and has followed a bunch of quartz which gives $300 assays. It is looking very promising. A shipment of bullion, amounting to $13 515.24, was the result of a final clean-up of the last crushing.

NORTHERN BELLE.—The daily yield of ore from this mine is about 62 tons. Mill No. 2 started crushing again on the 14th instant, all the repairs being fully completed and the mill put in excellent order. A shipment of bullion, amounting to $6,295 66, was made on the 18th instant.

JEFFERSON DISTRICT.

ST CHARLES.—Belmont *Courier*: The St. Charles mine at Jefferson is looking better and better as work progresses. The ledge is wide and well defined and carries very high-grade ore. Persons who have recently inspected this property pronounce it one of the best in this part of the State.

LEWIS DISTRICT.

BETTY O'NEAL.—Lewis *Herald*, May 17: The usual amount of ore is being extracted from the Betty O'Neal mine. The stopes are looking well and plenty of ore in sight. The sinking pump and column pipe have arrived and will be placed in position as soon as possible. Eight hour shifts will be put on and the shaft sunk as rapidly as possible. New levels will be run and stopes opened up. It is the intention of this company to push the work and open their mine up in good shape. Bullion will be shipped twice a week. Judging from the bullion output, the company will have a large working capital in their treasury, the proceeds of their mine, which will be much more satisfactory to the stockholders than having to pay Irish dividends.

MORNING STAR.—The connection on the 228 level was made on Monday evening between the Morgan and Mayo inclines in the Morning Star mine, opening up a block of stoping ground, 228 ft in depth by 200 ft in width. The last assays of car samples from the lower levels was $95. There is about 600 tons of ore on the dump and at the forks of the canyon ready for milling, and the intention is to work a large quantity in the Eagle mill as soon as arrangements can be made for the Betty O'Neal Co. to let their ore lay over a while.

NEW PITTSBURGH.—Great excitement has been caused by the locating of a mill-site and town site in Crum's canyon. The new town we hear is to be called Pittsburgh, and will no doubt rival its famous namesake in a year or so.

STARR-CROVE.—Reports from reliable sources are to the effect that the Starr-Crove mine will be started up in a short time. It will take a week or so to settle up the affairs of the company, but there seems to be no doubt that the matter will be satisfactorily arranged and operations resumed at an early date.

PIOCHE DISTRICT.

"THE FLAG IS STILL THERE."—Pioche *Record*, May 13: During the week preparations have been going on for the purpose of starting in retimbering the shaft of the American Flag mine. It will be timbered for a distance of 700 ft, down to the body of base ore. This ore body has been thoroughly tested by assays. The ore, sorted, goes $150 per ton, but unassorted, it averages $80 per ton. Now that there are furnaces for working base ore in our immediate vicinity, it has been determined to extract this ore. It will take about 5 months to retimber this shaft.

REVEILLE DISTRICT.

FAVORABLE.—Belmont *Courier*, May 20: Favorable reports continue to come from Reveille district. The ore encountered in the mines is of a high grade, and good quantities of it are being extracted. Bullion amounting to about $20,000 has been shipped from the Cila mill this spring.

SPRING VALLEY DISTRICT.

THE VANDEWATER MINE.—*Silver State*, May 20: The Vandewater mine, generally known as the Eagle, situated in Spring Valley, is now being worked by a New York company, of which the late Cornelius J. Vanderbilt was president. The superintendent, E. D. Luxton, formerly Vanderbilt's private secretary, and one of the executors of his will, was in town yesterday, on business connected with the estate. He informed a *Silver State* reporter that the Vandewater mill is now at work on refuse ore from the old dumps, which assays from $7 to $26 per ton in gold. The mill reduces about 30 tons of ore daily, and it is worked exclusively for gold. A new shaft has been started on the mine, and is now 42 ft deep. This shaft is located near the west end of the original Eagle ledge, where the ground was abandoned as worthless by the old company. The shaft is now in ore that assays from $20 to $40—three-fourths of which is gold—to the ton. Mr. Luxton says the present Vandewater G. & S. M. Co. bought the property, believing it to be valuable, and they will prospect it to a depth of 500 or 600 ft if they do not find paying ore in paying quantity nearer the surface.

TYBO DISTRICT.

THE MILL.—Cor. Belmont *Courier*, May 18: Since Mr. N. S. Trowbridge's return from California he has been very busy in reconstructing the Tybo mill. New improvements have been added, old machinery being replaced with new, in fact, the mill is in better shape today than ever before, for he was preparing for a long run, there being at least 1,500 tons of ore on the dumps and ore chutes to be crushed. The boilers were to be hired on the 10th, but, unfortunately, Tybo is again under a cloud. A message reached here summoning N. S. Trowbridge to San Francisco, and the time for starting the mill had to be postponed until Mr. Trowbridge's return, which we all trust may be very soon. The nature of the war cloud I could not penetrate further than that it did not look disastrous, and we all hope that it may prove so and reveal a bright future for Tybo.

ITEMS.—Messrs. Page & Donnel are developing a fine body of ore on their Red Rock mine, it being the extension of the 2 O mine.....The Mountain View Co.'s new mill is going up as fast as money and labor can accomplish it. Their mine looks well.

ARIZONA.

GROOM CREEK.—Prescott *Courier*, May 16: Gentlemen who went out to Groom creek Saturday and returned Sunday last are very well pleased with the way mines and miners are looking and yielding. Geo E. Berry and others have a 50-ft shaft on the Adel. They had saved about 40 tons of ore and are steadily adding to the pile. Mr. Merrington, superintendent of the mill, recently made careful samples of George's rock, and it gave gold per ton, $97; silver, $50. The ore body was of good size when our informant saw it. Mr. Merrington has men taking ore from the Chicago mine. The mill was not running, but will be in a very short time. We think it would be well if owners of rich Groom creek mines would go to work and take out more ore.

BLACK HILLS.—M.A. Ruffner, just from Black Hills district, says that when he left camp there were on the Hermit mine dump 40 tons of extra good copper ore. The ledge was opened to a depth of 50 ft below the surface. Having recently conversed with miners from Walker & Hassayampa mining districts, our impression is that Dr. Farnsworth, who is operating for a New York company, is developing several fine ledges, notably the Bodie, in Hassayampa district, the Mifflin, Wadleigh and Kishacoquilles in Walker district. Men are drifting and sinking. We believe it is the intention of the company to very soon erect a furnace near the Bodie mine. Mr. Callen and a party of gentlemen from the east are looking at mines, etc., in Walnut Grove district.

MUSIC MOUNTAINS.—Pioche *Record*, May 13: These mountains are located in the northwestern portion of Arizona, but, owing to no known water or springs, the prospectors feared venturing among them. We learn from George Latimer, who recently returned from that Territory, that the prospectors have at last gotten into the Music mountains and uncovered several gold ledges. The Haulpai Indians have been in the habit of going into these mountains to hunt, but were careful in not permitting white men to follow them, or disclose where water was located. A prospector, 4 months ago, trailed the Indians to water, and, after a few days' search, discovered the location of several springs. As yet, there are but half a dozen men prospecting in the above-named mountains, and some of the ledges discovered are reported promising.

COLORADO.

THE FLETCHER MINE.—Georgetown *Courier*, May 20: The Matilda Fletcher mine, on Democrat, continues to pay largely. Last week Warren Young had between 7 and 8 tons milled, which was taken out by drifting 15 ft and raising 20 ft, that netted nearly $3,000, the first-class returning 445 ounces of silver to the ton, and the second-class 304 ounces. This month he is continuing his drift, and will probably commence stoping, the ore vein still being very large. Good ore has also been struck in a raise over the second level, which is leased to W. M. Fletcher & Co., who have a vein of smelting ore 6 inches thick, a sample run of which returned 210 ounces to the ton. The lowest level is being driven ahead by Bart Hopkins & Co., who have 6 inches of quartz that carries a small amount of ore.

IDAHO.

AN IMPORTANT CONTRACT AWARDED.—Wood River *Times*, May 17: The Moore brothers have been awarded a contract to haul all the ore which the Bullion, Mayflower, Jay Gould and Eureka mines will yield this summer, down to Hailey, where it will be loaded for the railroad. At Hailey the ore will be received by a joint representative of the owners of the mines named, and forwarded. If the railroad is completed to Hailey before the close of the shipping season, the contractors will deliver it at the depot without extra charge. The price agreed upon for hauling from Bullion to Hailey is $2 per ton. The Moore brothers will make two trips a day. Their teams have a capacity of 50,000 lbs at a load.

VIENNA MINING DISTRICT.—A new mining district has just been created, as follows: Beginning at a point on Sandy Gulch creek, 14 miles north of the town of Vienna; thence west 5 miles to a point; thence south 10 miles to a point on South Boise river; thence east 10 miles to a point on Big Smokey; thence north 10 miles to a point on the divide between the head waters of Wood and Salmon rivers; thence west 5 miles to the place of beginning, embracing an area 10 miles square, as provided by the Territorial statute. David M. Snyder has been appointed Deputy Recorder for the new district. His office will be in the town of Vienna.

MONTANA.

THE LIQUIDATOR.—*Inter-Mountain*, May 18: With the recent developments on this valuable copper property the readers of the *Inter-Mountain* are already familiar. The property has opened up wonderfully well and is already regarded as one of the most promising copper mines in the district. Within the past few days $2,000 worth of ore has been sold to the Montana Copper Co. by the owners of the Liquidator, who shipped it to the smelter without concentration or sorting. Besides what has been sold, McDermott & Co. have on hand 50 tons of ore assaying 28%, 40 tons of ore assaying 25.5%, and 20 tons assaying 40%, and the dump is rapidly increasing in size.

JEFFERSON NOTES.—Cor. Helena *Independent*, May 20: The Wickes reduction works, a few miles from here, have been a great benefit to this place. The number of men employed by the Alta Montana Co., directly and indirectly, will, I believe, number about 300. The Alta mine, one of the principal mines of the company, is looking well, showing large bodies of rich ore. The doors of this mine are not closed, and the genial foreman, Lyman Rowley, will be pleased to show anyone through the mine. A force of about 50 men is kept constantly employed. The Custer mine is being operated by this same company, a force of 12 or 15 men being employed. The Cornet mine is soon to be started up. Favorable results may be looked for. Still, for all the disadvantages of location, Wickes is a pretty place. It has been the firm determination not to have a saloon in the place, and, in that end, the company has been successful. The works are running nicely in all the various departments. The Gregory Con. Co. has spared neither pains nor expense to build works that will return dividends. The Gregory mine, I am informed, is looking better than ever before. This company employs about 200 men, directly and indirectly.

NEW MEXICO.

NOTES.—*New Southwest*, May 13: Bremen's mill is still running day and night, on high grade ore....Some valuable mining property in the Hanover district was sold this week....It is rumored that there are some heavy sales being negotiated in the Hanover district.... Half interest in the Sherman mine was sold yesterday by Messrs. J. and B. Williams, to the Income company.... The Silver City Co.'s mill has been shut down during the past week for want of cord-wood. Arrangements have now been made for a constant supply, and the mill will start up on Monday next.....At the Sherman mine good progress has been made at all points during the week. A fine body of high-grade ore has been found just above the tunnel level. This is by far the largest body uncovered in this mine. At several other points good ore has been found. The drift connecting the 100 level with the main shaft is nearly through. A good shaft house over the main shaft is being erected. The Silver City Co's mill will start up about Monday on Sherman ore.

OREGON.

NOTES.—Jacksonville *Times*, May 20: A large quantity of gold-dust will be taken out this season, after all..... A. Bowman is running the English Co.'s hydraulic at Galice creek.....Ingram & Beck, of Willow Springs precinct, are now cleaning up and doing well.....Jack Layton, of Applegate, still has a large head of water, and is doing better work than ever.....J. Klippel & Co., of Foorman's creek, are cleaning up, and propose to do considerable drifting during the summer.....Gin Liu made another good clean-up a few days since. He is taking out considerable gold at Uniontown, and also on Palmer creek.....The Sterling Co. has a full head of water and expects to continue piping night and day until the latter part of August. A heavy clean-up is expected then..... G. F. Topping, who was in town Tuesday, informs us that Alex Watts, of Williamsburg, has about cleaned up, with favorable results. $1,500 have already been taken out..... C. H Barkdell informs us that some California prospectors are in the vicinity of Blackwell, and that more prospecting for quartz will be done this season than for some years past. He proposes doing some substantial work himself soon.

UTAH.

LULU.—Southern Utah *Times*, May 20: Work on the Lulu still continues without much change, which is not looked for until the ledge is struck, which will be for some time yet.

THE HORN SILVER continues its regular shipments of ore to Frisco and Francklyn. The north shaft is still being sunk, and they are drifting north on the 5th level.

THE CACTUS is now down 50 ft and looks very favorable. The ore continues about the same as last reported, yielding about half a ton to the foot in depth of the shaft.

WORK on the St. Marys continues as usual. This mine has a large body of ore in sight and has had for a year.

THE COMET is still working and looks big. It has several tons of 150-ounce ore on the dump and plenty more in sight.

THE MAMMOTH tunnel is still working and is now very near to the ledge.

THE shaft on the South Horn is still going down. The ore continues mixed through the rock and spar, and they will probably have to drift to catch the ore body.

MR. O. T. CLARK is working his mine, the Monitor, in Star district. He has a fine showing of ore, which is increasing in quantity as depth is attained.

THE Wood River ore shipments will begin to arrive in Salt Lake about the last of the present month.

Extracting Copper and Other Metals from Their Ores.

For smelting the sulphides or other ores of copper, Mr. W. W. Hughes, of Bayswater, proposes first to use a cupola or reverberatory furnace, and to mix all necessary fluxes with the charges. The slag is run or drawn from either of these furnaces in the usual way, and the regulus is run off into sand-beds, or he runs the molten regulus into a ladle and pours it into the desulphurating furnace, places the regulus obtained from the sand-bed into a large melting reverberatory or other furnace, where he brings it into a thoroughly molten state, and after drawing off any slag that may have risen upon it, he runs it into or carries it in a ladle and pours it into the desulphurating furnace, which is heated up ready to receive it. He uses a desulphurating furnace, the main bed of which is longer than it is wide —say, about 9½ ft. long and 6½ ft. broad, internal measurement. The depth of the furnace from the level of the skimming plate to the bed is about 12 inches, but these dimensions may be considerably varied, and the furnace may be made larger or smaller as desired. The two ends of the main bottom of the furnace are semi-circular. At one end is a skimming door, and in front of this door the bed is stepped up, say about six inches, forming a platform and hay measuring two feet long along the center of the furnace. Into this hay the slag accumulates before it is drawn or run off. At this end of the furnace is also a flue leading to the culvert or chimney stack, whilst the fireplace is at the opposite end of the furnace, as in an ordinary reverberatory furnace. The flue leading to the culvert or stack he makes larger than the flue of an ordinary copper smelting furnace, otherwise the fumes of the sulphur would for want of vent be driven out at every opening in the furnace.

The fire is required for creating a draft when the furnace is not working on a stack with other furnaces, and is at all times required for keeping it hot between the charges and for heating it up after repairs. He places a small door in each side of the furnace, one door near one end of the furnace and the other door near the other end of the furnace, and opposite to these doors he sets tuyeres in the walls of the furnace. He uses one or two tiers of tuyeres, according to the depth of metal to be blown upon, the lower tuyeres a little above the bottom, the upper tuyeres a little higher in the side of the furnace. By placing the tuyeres in the opposite sides and ends of the furnace, the blast keeps the molten contents in rapid circulation and supplies itself with a constantly renewed surface to blow upon. The blast enters through the sides of the wall. He uses large tuyeres with a moderate pressure, rather than small tuyeres with a high pressure, as he finds in practice that it is not heat so much as air that is required to drive off sulphur. He uses either clay or iron tuyeres.

When he commences each operation with the desulphurating furnace, as soon as the molten regulus begins to run, or as it is poured into it, he puts on the blast and increases it to the required strength. As the contents rise to a level with the skimming plate, it is always kept at a level by running or pouring in molten regulus as the slag is drawn or run off. When the contents of the furnace are brought up to 85% or 90% of metallic copper, he runs it off either into sand beds or into iron molds, and begins another operation.

Silent Smelters.

Why is it that there are so many smelters and stamp mills lying idle, if not utterly abandoned, in Colorado? In traveling through the mining regions, a by no means infrequent sight is a building in which it was originally intended to treat ore by one process or another, and which has cost a large sum of money, standing idle and valueless, when it should be the seen of unceasing activity and a source of great revenue.

This strange sight may be explained in several ways. In some cases mills are erected by over-confident individuals in localities where the output of ore does not warrant any such display of enterprise. The mill man, however, anxious to be first on the ground, and, possibly, with more money than good judgment, accepts as true the rose-colored statements of prospectors concerning their claims, and hastily puts up his machinery, only to find, after a large outlay of cash and time, that there is not enough of paying mineral in all the country around to keep a mill busy one month in a year. Again, the would-be mill owner inspects neighboring properities himself, and decides that he can derive from them a plentiful supply of ore for the successful prosecution of his business. The mill is speedily built. Then its unfortunate proprietor discovers that he knew very little about determining the true character of ore and its suitableness for treatment in his peculiar kind of mill; or the ore may change in character; or mine owners may fail through any one of many causes to produce a quantity corresponding with their original estimates. Then the mill, the birthplace of so many bright hopes, is abandoned, sadly, but of necessity, and remains a monument to the folly of too hasty action.

Among those who go down to the mines to smelt ore, the case is of a like nature. Smelting is a process more intricate and difficult than milling, and shutting down a smelter is less practicable than shutting down a stamp mill. The smelter must have a large and continuous supply of ore to treat, and, above all, must have a manager of experience and full of resources, who can overcome the refractory nature of ore by some other process when the ordinary course of treatment fails. Merely theoretical men cannot manage a smelter. Practice alone, as much as in any other business in the world, makes perfect. Many an establishment intended for reduction works stands idle today, after involving its owners in extraordinary expense, because of the incompetence of its so-called managers. Fledgeling "experts," fresh from college, and ambitious persons filled with visionary and impracticable ideas and plans, are not the ones to manage smelters and mills, and it is due to the employment of such as these that many thousands of dollars have been lost in mining communities.—*Leadville Herald.*

Sex in Mineral Veins.

A few weeks since we gave an article on the above subject from the London *Mining Journal.* We now append a letter from Mr. James Williams on the same subject, referring to the previous article:

I am very pleased at seeing in the *Mining Journal* an article on "Sex in Mineral Veins." The subject is not by any means a new one, as it is an idea that has occupied my attention for the last 30 years, and I am fully satisfied, and have been for many years past, that we cannot apply the word sex to mineral veins, as on close inspection I have found that the north and south vein (and which Mr. J. Van Cleve Phillips, New York, would term a male, and non-productive) by a secondary influence has become the bearing or productive vein.

A short account of my investigation of mineral veins and what led to it may not be out of place. Standing on an old mine barrow and elevated, on looking southeast and northwest, I was somewhat surprised at beholding a number of mines in that direction, as our Cornish mines, with but few exceptions, are east and west, and the above was a few degress south of east and north of west. Where I stood I could take in a distance of from four to five miles, and the number of mines (about six), and on visiting the mines separately, I found that each had been made productive on the east and west vein, except the last. All the former veins had been made productive by the cannter running in the direction named above, and non-productive until forming a junction with the east and west vein, but the last to the south of east was in the direction of and with the Nine-o'clock vein, and up to this point might be termed the male or non-bearing vein. But at this point it changed its character, and became the female or bearing vein, in consequence of being disturbed by an elvan conrse as a secondary element, and was very productive for a short distance, and was called Wheal Chance in South Crenver, where thousands of pounds were recklessly wasted looking over a second Wheal Chance, but not finding a secondary element or elvan conrse, their money was spent in vain.

The next we shall hear of this caunter carrying its head, and pursuing its conrse, so to speak, east and by south, will be in Poloreho mine, to the east and south of South Crenver, now commenced to be worked by Mr. Battye, Secretary, Great Winchester street, London, which I have considered for years to be a valuable piece of ground, second to none. As I prefer giving a reason for the faith that is in me, please permit me to do so in this instance, as it is of the utmost importance.

This caunter or Nine-o'clock vein, after being traced a few miles through highly mineralized ground, with varied but beneficial results, we now have in Polcreho mine to the west and north it will intersect a northeast and west vein, then three veins east and west, parallel to each other, and underlying to form a junction in depth, and which is about the center of the sett. It passes on, and in the south part of the sett it will again form a junction with three other east and west parallel lodes, about 30 ft. apart at surface, and coming together in depth. One of those (the south one) was made productive by a cross course as a secondary element. When this vein was first discovered close to the cross-course, and only 28 fms. from surface, it was in September, 1872, worth more than £84 per fm. The best work made 7 cwts. 13 qrs. of tin to 20 cwts. of the vein (tin hook now before me—amount, £209 10s. 6d.); yet this sett was condemned by all the old-fashioned miners. It is quite time a new state of things should take place, so that we could with a greater amount of certainty find our mineral deposits. I have used every effort to form an Inductive Scientific Mineralogical Institution, visited London in 1879, was three times to Marlborough House to endeavor to see the Prince of Wales and Duke of Cornwall, being extensively interested in mining property in the county, and, as I then stated, I now again affirm that the Prince of Wales' income may be increased by 50%; also all the mineral land proprietors in proportion.

It is only three-years since I made the attempt to see and interest the Prince of Wales with my theory. However, I am not out of heart or discouraged, as I read that Mr. Samuel Morse, the inventor of the electric telegraph, presented himself at the White House Congress in America in 1837, where he was laughed at and jeered by those who should have assisted him, and did assist him after wasting six years of precious and valuable time. I suppose I must hope to be more fortunate than was Mr. Morse with his valuable invention.

"Old Coloma."

The name of Coloma always brings to mind Suttor's old mill and that first nugget of gold picked up in the tail-race thereof by Marshall; but of late years the old camp has been better known for the great quantities of excellent fruit grown there than for its yield of gold. For many years Coloma has been a very quiet place, but now it appears likely to awake from its long sleep amid its great circling hills.

Rich discoveries in the way of both gold quartz and gravel are now being made in that vicinity, and men who have not thought of prospecting in the last 20 years are taking to the hills.

Dr. M. Holmes, for years in the early days a resident of Coloma, day before yesterday returned from a visit of some days' duration to that section, and he is quite enthusiastic in regard to the present prospects of the old camp. He says a few days since two young men, who for some purpose broke a road for a considerable distance into a region of chaparral, unexpectedly came upon a quartz vein showing free gold above the ground. They took out over $600 in one day with pick, mortar and pan. All that section is filled with quartz veins, and there are thousands of acres of hills and flats, covered with greasewood, which have never been trodden by the foot of man. The discovery mentioned above was made in White Oak township, on the Sacramento road, about eight miles from Coloma. Several other veins of quartz showing well in gold have been found in the same vicinity.

Cement mines are also being looked after. Interest in cement has been excited by the rich strikes recently made at Prospect flat, some two miles above Placerville, also in the Cedar Springs mine, just in the edge of the town. In Prospect flat, the gold is in fine scales, and so much is there of it, that it forms yellow streaks across many lumps of the material. The cement from Cedar Springs is heavy, and is in the shape of cucumber seeds. Some pieces weigh from half an ounce to over an ounce. Cement is being taken from both these mines that will pay $20 to the pound. It is literally filled and sparkling with gold. At Grizzly flat, east of Placerville, some rich strikes have this spring been made in quartz.

All these strikes have set the people of Coloma to thinking that there is no reason why all their surrounding mountains may not contain rich quartz and cement. As in many other places in California, the old settlers have not thought about going out prospecting in many years, and there are all about the town places that have not been looked at since the days of "forty-nine."—*Virginia Enterprise.*

Silver King.

Great activity exists at the Silver King mine. The new superintendent is pushing things with great vigor in all departments at the mine. They have erected a sawmill, and a new carpenter and blacksmith shop. In the new double-compartment shaft they have now two cages, dispensing with the bucket. They have overhauled the hoisting works, supplied them with a new steel boiler, of 70-horse power, which gives them ample power to reach a depth of 1,500 ft. The capacity of the old boiler was only 12 horse power. It will be used as an auxillary to the new engine. They will continue sinking in the shaft with increased facilities, make very rapid progress and strike out on new levels at suitable points. On the 700 level, they are excavating all around the drift, in ore everywhere. It appears to be without a limit. This drift is now 132 ft. toward the northwest, from the main shaft. The excavation has reached 105 ft. in width. They are now cutting mainly on the northeast side of the drift. The mill is running to its full capacity, all the roasters, concentration tables, lixiviation apparatus, stamps and smelting furnace working at full speed. Several important changes have been made in the working forces, the most important of which is the retirement of Ottokar Hofmann, who gives way to Charles H. Aaron, as metallurgist and chemist. Messrs. Kurth and Fischer of his force retire with him. James Duffy, the engineer, and several others also give way to new hands. All these gentlemen have long discharged their duties in the King reduction works with marked ability and punctuality. The ore teams are as busy as they can be supplying the mill with ore from the mine. The immense supply of cord-wood on hand covers nearly the entire mill-site, and all the King now wants is an additional mill with 100 stamps and everything else in proportion. Then it can run out more bullion than all the rest of Arizona together, and he the King, indeed, quadrupling its monthly dividends.—*Pinal Drill.*

THE WOOD RIVER SITUATION.—The Wood River *News* says: "Stay away. We hear of thousands on the road to Wood river, packing their blankets and begging their way. Better keep out. You won't have wind enough to cuss the country with by fall. All Wood river wants is men with coin to buy mines and develop them, or certainly enough to prospect with. A disturbance occurred at the corner of Main and Elm streets yesterday, and in a minute 500 men were counted in the crowd. Lots of loafers here now, and when we say loafers we mean men who have no visible means of support."

The Gravel Miners.

We have just had a talk with one of the 1,000 miners who are employed in the gravel mines on what is known as the Ridge, in this county. We learn from him that miners in that section are thoroughly organized in a Miners' Union, which has for its object taking care of miners who have been injured in their work, or who may be sick and in distress, and for purposes of general protection.

This organization, we understand, is determined that no injunctions from any valley county judge shall deprive its members of their daily bread, and that it will be very dangerous work for any lawyer from the valley to attempt process serving on the Ridge. A great number of these 1,000 miners own their own houses, with small vegetable and fruit ranches about them. Their surplus earnings have been devoted to improving their little homes, and should the mines be closed, and they be compelled to seek their subsistence elsewhere, they realize that they would be giving up the work of the best part of their lives.

It is an unfortunate condition of affairs which has brought about such a determination of our laboring classes to resist to the bitter end any mandate of the valley judges. The miners, neglecting the nice formalities of the law, cannot see what right the judge of Sutter county has, by one stroke of his pen, to arbitrarily deprive them of their only means of subsistence, and to annihilate their frugal savings.

The valley newspapers talk an infinite deal about the destruction of happy valley homes by slickens. For one home destroyed in the valley we will guarantee to point out 20 more comfortable homes which will be destroyed in the mountains should gravel mining be prohibited.

It was agreed, we understand, that no legal attacks should be made against the miners until the decision of Judge Temple has been given on the Gold Run case. The lawyers of the valley people, however, have, as usual, broken faith in the matter, and have lately been trying to close the mines at Dutch Flat, by their favorite tactics of injunctions. The miners there treated the process server to a dose of cold water, and he was glad to get away with such mild treatment.

Everybody recognizes Judge Temple as both able and impartial, and it seems as though the valley people are unwilling to abide by his decision, which will doubtless be given in a few weeks, and are determined to do all in their power to increase the ill feeling which now so unfortunately exists between the valley and the mountains.—*Nevada Transcript.*

Jordan District.

Jordan mining district, adjoining Homer on the east, was organized on the 22d of April, 1879, but its boundaries were not clearly defined until the 20th of June, 1881, when the annual meeting of the miners adopted the following: "That the boundary lines of Jordan mining district shall be as follows: Starting at the mouth of Lee Vining creek and running west to the east line of Homer district, and then north along that line by the foot of Lundy lake to Virginia creek; thence down that creek to where the old Bridgeport trail crosses Virginia creek; thence east to the Lonis Lockhurn cabin at the mouth of Mono gulch, and then south to the mouth of Mill creek, and then across Mono lake to the place of beginning." Jordan district embraces many rich auriferous, argentiferous and cupriferous quartz ledges, as well as extensive deposits of auriferous gravel, the latter lying chiefly along the tracks of the Mill Creek glaciers and under the adjacent moraines. At present the Detroit Copper mining company is engaged in opening some of the copper mines, which are among the richest known in the history of that metal; the Mono Lake Hydraulic mining company is operating on an extensive scale on lower Mill creek, and others are engaged in opening what promise to be valuable gold and silver bearing quartz ledges. G. Adolph Lippert is the present Recorder of the district, and the annual election will take place on the 20th inst.—*Homer Mining Index.*

SEAMLESS BOILERS.—The *Blacksmith and Wheelwright* says that a seamless boiler, or one made with welded joints, is a great novelty in this country, and doubts very much if many of its readers have ever seen such a construction. Their use in England, however, for many purposes is the rule rather than the exception; and they are there employed not only on account of their quality, but also on account of their relative cheapness, comparing them with other forms. We do not know of a single establishment in the United States that is prepared to do work of this kind. We do know several which are experimenting in this direction, and hope ultimately to be able to compete with our English cousins in a field which they occupy alone at present. These statements serve to show the relative positions of the two countries in some kinds of smith work.

THE Hudson River tunnel has now reached a distance beneath the river of 239 ft. in the North tunnel, and in the South tunnel 700 ft. The work is progressing at the rate of 4½ ft. per day.

Overcoming Summer Heat.

The time is approaching when the thermometer will do its best work in the hot valleye of oar State, and aids to withstand the heats may be valaahle. It is generally known that the lofty marks to which the mercary sometimes ascends are aot true measures of heat effects upon men and animals, bccaare, through the dryness of the air, there is none of the prostration which accompanies great heat in countries with a moist summer. Nevertheless, there are times when it is qnite valuable to be ahle to reduce the temperature a few degrees. The best way to do this is hy using the coolness which proceeds from the evaporation of water. Perhaps a lesson can he learned from East India contrivances. Acoordiag to *Chamber's Journal* they use in India what is called a "tattie," a large curved or sloping screen, whioh accurately fits into eaoh door or window facing the west, and is made of the roots of the khuskhus grass (*Andropogon muricatus*), which siagalarly combines strength and porosity with the most delicious and refreshing fragrance. These screens are ahout an inoh in thickness, and, during the hot and dry west wiud, are saturated from outside with water, whioh immediately commencee evaporating uader the fierceness of the blast; and as evaporation always implies cold, the wind which, in the veranda, would raise the thermometer to 120° Fahr., passes into the house at 75° to 80°, laden with adelioioas fragraace. While tatties are in working order all other cooling appliances are unnecessary.

In the neighborhood of Gwalior and Jhansi there is another form of tattie. A small, creeping, thorny variety of the her (*Zizyphus jujuba*) is largely found in the juagles; this is collected and dried, and at the proper time the whole west veranda is inolosed with thorny walls nine to ten inches thick, and these being saturated from the outside, all doors are thrown open, and a delightful temperature is secured. Tatties are of no nse during the easterly wind, whiob nshers in and accompanies the rains. Laden with moistnre it is a damp wind, and therefore retards evaporation. The creeping thorny plant, *Zizyphus jujuba*, is growing in different parts of this State, and is known as the jajube, and could be had for tatties, if the growere wished to sacrifice the fruit which they are growing it for. But it is not at all necessary that we should take the time required to weave the thorny jujube into hrush-cloth. All that is needed is to get some material which will hold the water in contact with the air as it passes through. No douht onr tules wonld make good tatties, and the evaporation of water thrown on the leaves of vines thickly covering the sides of the veranda would produce as mnch coolness as a hedge of hrambles. There is great chance for ingenuity in choioe of materials and methods of usiag them, but the principle is oonstant, to wit, the evaporation of water before admitting the hot wind to the domicile. A good hot summer norther will certainly furnish the wind power to dry out miles of tatties.

High gr Low-grade Ores.—A six-ft. ledge of $30 or $40 ore, even should it be free milling, is too small a thiug for most prospectors. What they are after is a big ledge of $1,000 rook. They have not time to look at the small things. Experience teaches them nothing. If they have a prospect on which they have sunk a half dozen feet, that shows ore of a high grade, tbey will not look at less than $100,000 or so for it. Hundreds of hursted prospectors can be found who own locations from which rock that will assay $1,000, or more, oan be obtained, hnt these rich streaks are soarce. Capitalists have disoovered that large ledges of low-grade ore in the end prove the most profitable and permanent, and it is into these that they are putting their coin, on general business prinoiples. It would he hetter for a prospector to spend his time on a mine that he thinks something of than to fool around 20. People who have too many irons in the fire generally come out at the little end of the horn, and this is true in prospecting as in everything else.—*Grantsville Bonanza.*

The Dog Town Placer Diggings.—John C. McTarnahan is preparing to resume hydraulic mining in the old Dog Town diggings, six miles north of Lundy. Last season he prospeoted the ground thoronghly and found it to be rich in gold worth $18 per ounce, and will now commence operations witb a force of 20 men, working night and day. He has a long flume already construoted, and an unlimited supply of water in Green creek ready to turn on. There will be no tronble about slickens, as the alkaline land below will be benefitted by the debris from the washing. As there are thousands of acres of gravel adjacent to the tract owned by Mr. McTarnahan that appear to be equally rich in gold, it is to be hoped that he will meet with great success, and thereby stimulate others to oommence similar operations in the same vicinity.—*Homer Mining Index.*

The Utah and Nevada Railway is nearly oompleted, and will be of immense benefit to the mines of Tintio.

The prodnct of the Utah mines for the first quarter of 1882 is one third greater than for the same time in 1881.

Useful Information.

On the Drying of Oils.

All oils tend to chaage in the air; those lese pure changing more rapidly. Butter whioh has aot heea properly freed from buttormilk is a good example.

This chango is, first, the nnlinking of the oil-acid and the glyoerine, setting the oil-acid free. Still exposed to the air the oil may give a sharp, unpleasant odor and taste, due to further changes; it has hecone rancid. Rancid hutter may be sweetened, however, by washing it with some snbstance which will form a soap with these rancid acids and remove them. Lime water is sometimes used for this purpose; and the olearing up of a fatty linseed oil hy litharge is an action of the same nature. In this case a lead soap is formed by the acid and the litharge.

The drying part of the linseed oil—*i. e.*, the linolein (linsecd oil acid and glycerine ether) does not become rancid. The same is true of the drying portion of poppy oil and of other dryiag oils. The drying parts of these oils thioken and change into stioky, elastic, or into leather-like snbstances, all of which are waterproof, and upon all of which water has only a small influence.

The Changes in Oils.

The ohemical changes in oils which hecome rancid and in oils which "dry" are of the same nature; the results are different hsoause the oils are different.

The science of chemistry is founded upon weight. If a snbstance changes and weighs heavier than before tbe chemist is sure it has gained something. If a snbstance chaages and weighs less, he is sure that it has lost something. He then proceeds to discover what it is that has heen gained or lost, and in this his scales are again useful in weighing other snbstances with which this one has heen in contaot, in order to discover which of them has taken the lost something, or has given up the something gained.

Linseed oil in dryiag gains from 8% to 10% in weight. A French chemist exposed some dryiag oil to the air. It weighed ahout 155 grains; after 18 months, ahout 166 grains. It had gained ahout 11 grains, or more than 7% of its weight. In speaking of the drying of linseed oil, therefore, we mean merely a change from a flnid to a solid condition. There is a loss of something, as we shall see, hnt tbere is a gain which not only makes up in weight for the loss hut usually leaves the same quantity of linseed oil 10% heavier than hefore it heoame "dry."

Influence of Heat in Drying Oils.

Heat also has a very important effect in drying oil. In a recent experiment, two panels were painted, one of which was subjected to a natural heat of from 60° to 68°, and the other to an artificial steam heat of 176° F. The panel which was heated was exposed to the extreme heat bnt two hours the first day and four hours the second day. The heated panel gained .211; the panel not heated gained .004. In other words, excessive heating dried the panel about 50 times as fast as when exposed to an ordiaary summer atmosphere. Experience has shown that moist heat must be used, and that any beat much over 176° is iajurious.

The Gain in the Weight of Drying Oil.

We have seen that oil in darkness hardly increases at all in weight. In the light, and especially if heated, drying oil becomes from 8% to 10% heavier. Doss it get this weight from the rays of light? Science has shown that these rays have no weight—that hoth light and heat are merely waves of motion, like the waves whicb spread over the surface of smooth water when we throw a stone into it. The water is no heavier for the motion, it is ouly heavier hecause of the stone. Air, bowever, has weight as a stone has—100 cubic inohes weigh 31 grains. Air, however, is not a simple substsnce; it is composed of at least three gases, nitrogea, oxygen and carhonic acid.

Chevrereil, a celebrated French chemist, made a series of experiments hy snhjecting painted panels in air-tight glass hoxes—No. 1 containiag carhonic acid, No. 2 containing nitrogen, No. 3, oxygen, and No. 4, common air. The result sbowed a gain of 11 parts of oxygen in 22. In other words, the quantity of oxygen gained was just equal to the original amount in the undried oil.—*Condensed from Railroad Gazette.*

A new and desirable papier mache process for covering floors is described as follows: "The floor is thoroughly cleaned. The holes and oraoks are then filled with paper putty, made by soaking newspaper in a paste made of wheat flour, water and ground alum, as follows: To one lb. of flour add three quarts of water and a tablespoonful of ground alum, and mix thoroughly. The floor is then coated with this paste, and then a thiokness of manila or hardware paper is put on. If two layers are desired, a second oovering of paste is put on the first layer of maaila paper, and then the second thickaess of manila paper is pnt on. This is allowed to dry thoronghly. The manila paper is tbon covered with paste, and a layer of wall paper of any style or design desired is pnt on. After allowing thia to thoronghly dry, it is covered with two or more ooats of siziag, made by dissolving one-half lb. of white glne in two quarts of hot water. After allowing this to dry, the surface is given oae coat of 'hard oil-finish varnish,' whioh comes and is hought already prepared. This is allowed to dry thoroaghly, when the floor is ready for use." The process is represeated to be durable and cheap, and besides takiag the place of mattiag, carpet, oil-oloths or other like coveriags, makes the floor air-tight, and can he washed or scrubbed.

The Influence of Light and Darkness and Colored Lights on Drying Oils.

A Dutoh ohemist who has made a oareful study of the drying of oils has arrived at the conolusiou that linseed oil inoreases in weight in almost exact proportion to its becomiag dry. Comparison of the inorease by weight of the drying oil under the several glasses gives the order of drying as follows: Most rapid under the uncolored glass, then follow blue, yellow, green and red, hut this order is of no oonsequence, nor trustworthy as a constant fact.

After 150 days, on the contrary, the gain in weight is greatest in the following order, under green, yellow, red, hlue and nncolored glass.

In darkness there is no drying, or it proceeds so slowly that it may be said not to go on at all. *Light is the first natural drier of oil.*

The powerful influenoe of light upon the drying oil indicates that a paintiag or varnishing shop should have many windows, and a great ahundance of uacolored light—no sort of driers in a shop are more valuable than windows.

These tahles also show that oil loses as well as gains something in drying, and that the least loss or greatest gain after many days is in slowly drying oil.

Japanese Hand-saws.—The Japanese hand-saws cut on the pull-stroke; so no matter how hard the wood or dull the sap, they will not hend or huckle. It is rather more difficult to saw to line with such saws than with ours; hut they have their advantages. Take one of our key-hole or compass saws, cntting on the pnsh or shove-stroke—what an aggravating, limber thing it is. Now point tbe teeth the other way, and you have a tool that will keep stiff no matter how maay knots it encounters or how dull it gets. In other words, the pull-stroke of 3,000 years ago is the best for such thin, narrow hlades.

Good Health.

Diet in Corpulence.

Joseph Harrass gives some interesting hints on his personal experience in treating corpulence, which may he heneficial to others suffering as he did. He was corpulent, had irregular and feeble action of heart, tendency to fainting, difficnlty of breathing, and many disagreeable sensations in the head indicative of nervous exhaustion. Hight, five ft. six inches; normal weight, 150 lbs.; age, 59; weight at heginning of treatment, 200 lbs. Began treatment Ootober 8th. Treatment as follows:

Breakfast—Vegetables, brown hread (toasted), water, with lemon juice, and ocoasionally oatmeal.

Dinner—Vegetables, brown bread, water and plain pudding.

Supper—Brown hread (toasted), stewed fruit and water.

No tea, coffee, cocoa, or milk, except skimmed, and only a trifle of butter.

Result:

End of October weighed	187	lbs.
" November weighed	182	"
" December weighed	177	"
" January weighed	174	"
" February weighed	173	"
" March weighed	170	"
" April weighed	168	"
" May weighed	166	"
" June weighed	166	"
Present weight	150	"

All the distressing symptoms have been relieved, and the patient is so well he can again carry on his business. His physical and mental atrength have heen greatly increased.

Mr. Harrass says be has suffered no serious discomfort from his diet, exoept when away from home, and he feels as if be had learned an important lesson as to how to reduce his corpulence—which has heen such a source of discomfort—and once more enjoy life.—*Herald of Health.*

Digestion of Fats.—A querist asks, in the *Dietetic Reformer*, if fats, being rather hard of digestion, cannot be dispensed with as food, and sugar and starch used in their stead. To this the *Herald of Health* replies that fats are no more difficult to digest than starch; that they contain about twice as much force-giving qnalities to the pound, and that there being a special arrangement in the digestive apparatus for preparing them for absorption, it would seem ahsurd to dispense with them altogether. So, too, the milk furnished by the mother abounds in fats and sugar, whereas there is no starch in it, and this is evidence of its use in the animal ecoaomy. The prejndice against fats is not justifiable. It works barm rather than good. It is time there was a better nnderstanding on the snhject. The vegetarians need not abstain from fat becanse they eat no animal oils. Vegetable oils ahonnd, and are even more digeatible than the former, and purer and more wholesome.

Living on One Meal a Day.

We are oftea asked the qnestion, "How many meals a day should he eaten for health?" With few exceptions, we aaswer the qnestion thus: "Two meals a day are all that are required for the maintenance of health, and more and better work can he done on two meals a day thaa with more." We have heen trying the experiment for some sixteen years, and are so well satisfied with the results that we could not he induced to return to the old plan of eating three or more meals a day. The ancient plan of eating was twice a day. In fact, among the ancient Greeks, the custom was one meal a day natil three or four centuries hsfore the present era.

When hard pressed with exhaustiag labor, we have, for several years, adopted the plan of eating hut once a day until the period of excessive taxation was over, and have invariably found benefit by so doing, heiag ahle to accomplish more work and with less inconvenience, either at the time or afterward, than when taking two meals a day. We oandidly believe that the world would have hsen much hetter off to have adhered to the original plan of eating hut once a day.

There are many arguments offered against the one-meal or the two-meal plan, hut we have never heard one presented which was not easily answered hy experiance; aad the best way to silence all objectors is to induce them to make the trial for a few months. We have never known an instance in which a person has made a faithful and intelligent trial of the two-meal system without heing pleased with the results.

The Boston *Journal of Chemistry* recently published an article from a Dr. Page, who has been trying the one-meal-a-day plan, and claims to have realized great benefits; among others, a considerable increase of flesh. We quote a portion of the article, as follows:

"S. N. S., 28 years old, resolved to adopt the one-meal system, and did so, leaving off meat and all condiments, as salt and pepper, and eating ohiefly wheat-meal bread and fruit, tho bread made from unsifted meal and mixed with water only, no salt nor bread-raising devices—unleavened bread. Within seven months his weight increased from 145 lbs. to 170 lbs., and his strength of both body and mind had increased in proportion. His labor had heen severe; he is a machinist and an inventor, working 10 hours every day, and doing a good deal of practical and profitable thinking at the same time. It is now a full ysar since he came to one meal, and the weight gained has been maintained, and his health is perfect."—*Good Health.*

The Position and Movements of the Stomach.

According to Dr. Lesbaft, the Professor of Anatomy at St. Petershurg, the statemsnts current in anatomical text-books regarding the normal position of the stomach are erroneous. He has made careful observations on the point in more than 1,200 hodies, and has arrived at the followiag conclusions: The stomach doss not, as is usually asserted, lie horizontally in the abdominal cavity, hut vertically, so that the fundus touches the diaphragm; the smaller curvature and pylorus are to the right, and the larger curvature is to the left. Its position is in the left hypochoudrium, and the situation of the pylorns is in the vertical line formed hy a continuation of the right margin of the sternum. If the stomach is enlarged, no one part can he alone displaced, hut all parts are equally moved hy tho distention. The arrangement of the muscular fihers of the stomach is such that food enteriag it is moved toward the pylorus, where it can he most thoroughly mixed with the gastric juices, and it then passss haok along the center of the cavity to the fundus, where the resistance is least. This movement of the food along the wall to the pylorns, and hack again along the center, is rendered possible by the form of the organ, and it is probahle that it is to this movement that the peculiar shape of the fundus is due. As is well known, the fundus is absent in newly-born children. Thus the shape of the stomach determines the long retention of food in the organ for the purposes of digestion, and its slow passage through the pylorus. If the transverse colon is distended with gas, it may rise to the left of the stomach, as high as the fourth intercostal space, and even as high as the fourth rih. If the coils of the small intestine are similarly distended, the lower part of the stomach may be pressed forward, and the stomaoh may assume a more oblique position. Even a large stomach, accustomed to dietetic repletion, maintains a vertical position, but the pylorus is moved a little upward and to the right.—*The Lancet.*

Influence of Ale, Beer, etc., on Mothers' Milk.—Dr. Thomas Dolan has made a careful study of mothers' milk, and the various agencies which affect it, in a lying-in hospital, and published his conclusions. He states that there can be no greater mistake than to imagine fermenting liquors are necessary to the mother who is nursing a child. The milk may bo increased in quantity, but is injured in quality—renders the child irritable; exhausts the mother prematurely, and adds only a fictitious support. He has had a very large experience, and found good results by forbiddiag its nse, and giving inatead a pint of fresh, new milk.—*Herald of Health.*

MINING AND SCIENTIFIC PRESS

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Saturday Morning, May 27, 1882

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Passing Events.

There is very little to note concerning mining matters other than what is printed in our "Mining Summary" for the week. By reference to that it will be seen that nearly everywhere renewed exertions are being made this spring by miners in opening their mines and working them.

In prospecting, the Wood River region of Idaho and the Butte region of Montana are attracting the most attention. Men are leaving Utah, Nevada and this State for these new camps, and many are going who will before long wish themselves back again, as we see by the local papers that there is plenty of room for prospectors who have some means to keep them going, but men who want work are too plenty already. The season is fairly open in these regions now, and the hills are covered with prospectors. Before long we will no doubt hear of numerous strikes.

GOLD AND SILVER PRODUCTION.—A statistical abstract just issued by the Treasury Department contains statistics of the annual production of gold and silver in the United States from 1857 to 1881 inclusive. The figures show that the production of gold has declined from $55,000,000 in 1857, to $36,500,000 in 1881, and the production of silver has increased from nothing in 1857 to $42,000,000 in 1881. The total production of gold and silver in 1881 was $78,600,000, an increase of $3,000,000 over the year previous. The largest production recorded in any one year was in 1878, when over $96,000,000 were produced. The statistics of the production of gold and silver in California for 1881 are, gold, $19 000,00; silver, $870,000. In Nevada, gold, $2,700,000; silver, $8,860,000. Colorado, gold, $3,400,000; silver, $15,000,000. Oregon, gold, $1,000,000; silver, $80,000.

The Mine or the Superintendent.

There have been more failures in supsrintendents than in mines on this coast; there is no doubt about that whatever. In fact, when you come to think of it, a mine cannot be a failure; it is man's method of working it, or his inability to treat the ors economically, that constitutes the failure when such occurs.

We all of us can remember numbers of instances where mines have proved unprofitable under one superintendent, but which, when worked by a conscientious man who understood his business, have yielded good returns. This is no uncommon circumstance by any means. It was the man who failed, not the mine; yet such mishaps are laid to the mine every time.

In truth, many a good mine has been brought to ruin by a poor superintendent, and many a poor mine been brought to profit by a good supsrintendent. When both are thoroughly bad it is a hard case, but under such circumstances there is the stock market to fall back upon, and the mine itself need not be worked necessarily.

The ability, integrity and economy of the superintendent is as much a factor in the matter of profits as is the character of the ore. We have in mind an instance of a mine which was paying dividends at the time the supsrintendent was changed under a new management. The ore was just the same exactly, but in two months dividends stopped, and for a year the mine only just held its own, with the mill running all the time. Then there was another change for a more practical man, and in three months the mine began paying dividends again, and is doing so to-day.

If stockholders would insist that perfectly competent men only should be chosen to manage their properties, and that favorites of the principal directors should not be considered for the position, unless perfectly qualified, we would have fewer failures in every direction. Taking men out of offices and stores in cities to send them to mining camps where they must manage a lot of men, look after endless detail, judge in matters requiring technical knowledge, decide disputes, purchase supplies, and attend to the multifarious duties of a frontier mining superintendent, is only tempting ill-fortune and disaster.

This is often done under the mistaken idea that, as long as you have a lot of good miners, the mine will run all right. The superintendent is sent to look after the business or stock interests of the principal shareholders rather than to manage the mine, as a mine. Of course, all this is understood by those who have had experience in the business; but new men are constantly coming to the front, not many of whom commit new blunders, for there are few to invent, but nearly all make the old mistakes, of which the lack of care in choice of superintendents is the commonest and widest spread in its results.

POSTMASTER GENERAL HOWE in his letter to Congress recommending the abolition of postage upon newspapers and magazines says: "It may well be doubted if the whole people get as much information of public affairs from volumes gratuitously thrown at them by the Government, as they do from the newspapers and magazines which they purchase and pay for." The Postmaster-General recites other considerations which lead him to the conclusion that Congress may at the present time safely abrogate all discrimination between subscribers to newspapers and magazines, and send the same through the mails without charge, whether such subscribers live within the county of publication or out of it.

IT is expected that the furnace of the Clipper Gap Iron Co. will start up by the 1st of June, by which time enough charcoal will be on hand to insure a long run. To supply the necessary amount of charcoal, 30,000 cords of wood have to be cut, which is being done by a force of 125 woodchoppers, and the wood they cut is on land owned by the company in Placer and Nevada counties. This land lies on both sides of Bear river, chiefly on the Nevada county side, and comprises 8,000 or 10,000 acres. About 15,000 cords of wood have already been cut, and much of it hauled to the kilns.

THE agreement entered into by the manufacturers of cotton goods, cotton and jeans, and other low-grade textile fabrics, looking to a reduction of the quality produced in Philadelphia and vicinity, has gone into effect, and many mills shut down. The movement is to curtail the production of lower grades 50% and manufacture the finest class of materials of 22,000 looms. In Philadelphia nearly 10,000, or the greater number of those engaged in making the goods mentioned, have entered into a compact, and a large number outside of Philadelphia, have agreed to join the movement.

PREPARATIONS for the commencement of work on the seventy-mile gap of the Northern California and Oregon railroad are being completed, and the work will be begun immediately. The contract for the mason work on bridges and culverts was let to James Scoble, on Wednesday last. The work to be accomplished will take about two and a half years time to finish. The railroad is one of the branches of the Central Pacific railroad.

The Denver Mining Exposition.

We have before mentioned the mining and industrial exhibition which is to come off at Denver, Colorado, opening on August 1st, and closing September 30, 1882. A very large building is now being erected. Bonds to the amount of $200,000 will be issued, bearing 8%, and from the proceeds a fund will be available to defray all preliminary expenses.

The principal cause which gave birth to the idea of holding a "National Mining and Industrial exposition" in the great West was, according to the circular, the prevailing ignorance everywhere concerning the wonderful natural resources of that portion of this nation lying west of the 100th meridian.

It was felt that the necessity existed for removing the many erroneous impressions prevalent, and showing in the most convincing manner that this part of the United States, instead of being in one portion a barren desert, and in another a mass of snow-clad mountains, really contains a soil encouraging to the agriculturist, and a marvelous diversity of native minerals, only awaiting the introduction of manufacturing facilities to find an active market.

In mining, inventors will be stimulated by the demand for new processes that will make low-grade ores more profitable; in manufactures, capitalists and skilled labor will find every inducement for the establishment of new industries. The remoteness from Eastern sources of supply acts as a protective tariff to the producer here, where crude material exists in profusion, and is comparatively neglected.

To bring capital face to face with these opportunities for investment, and with skilled labor, to more rapidly develop the country, is an aim and purpose of the exposition, and the display now in preparation is designed especially to hasten the establishment of extensive and flourishing industrial communities.

Copper Rammers in Mines.

The English mining act, while it forbids the use of iron and steel rammers in blasting in coal mines, says nothing about copper ones. Recently a miner at Wigan, while ramming a shot, started an explosion which killed him and injured his companions. From the evidence it appeared the deceased was using a copper rammer, having discarded a wooden one owing to the hardness of the rock and the drill hole being smaller. Mr. Hall, inspector of mines for the district, stated that the law did not forbid the use of a copper rammer, the act only prohibiting iron and steel rammers. Mr. Ralph Betley, public analyst, Wigan, said the rammer used by the deceased contained 89.5% of copper, 8.2% of zinc, and 2.3% of antimony. The metal itself was somewhat harder than copper, but there was very little in its constitution which would lead to the belief that it would give results in working very much different from those given by a pure copper rammer. He had tested the rammer at a rapidly-revolving grindstone, and there was no difficulty in procuring sparks. A piece of copper rod held against the same grindstone produced sparks with almost, if not quite, as little difficulty. It would appear from these experiments that it was readily possible to produce sparks by the friction of particles of sandstone against the rammer, as also against a copper bar, and that it was therefore probable that sparks might be produced by the friction of the rammer against similar material in the shot hole. In reply to Mr. Hall, witness said the rammer used was not anything approaching an iron or steel rammer. In his summing up, the coroner said doubtless Mr. Hall would make a report to the Home Secretary on the matter, and the question would probably be raised whether copper rammers should be allowed to be used in stemming. The law enacted that neither steel nor iron prickers should be employed, but nothing was said with regard to copper. The general impression in the past was that copper would not give off sparks, but now that impression has proved a fallacy.

PLUMBAGO.—Six million pounds of plumbago are annually imported into the United States, and it is estimated that the home production in New York, Pennsylvania, Canada and elsewhere equals this amount. This valuable material is used principally in the manufacture of lead-pencils, stove polish and crucibles. Its market price varies, according to quality, from $25 to $75 per ton. There are great quantities of this mineral in this State, but no one pays any attention to it. On the Opir grade, between this city and Washoe valley, there is a large deposit that can be had by anyone who cares to locate and explore it. All that has ever been done with it was some surface shoveling in the early days by parties who tried to make fire-proof brick out of it by mixing with it a certain proportion of clay, and then burning.—*Enterprise.*

So many miners are leaving Utah for Wood River, that the *Tribune* thinks it looks as though there would be a scarcity there when the districts all open up this summer.

GOLD was discovered in Trinity county as early as 1849; mining has been successfully prosecuted as the leading industry ever since, and yet the county is not half prospected.

Underground Temperature.

The subject of temperatures in mines is one of very great economical importance. When we remember that in very deep mines the lower levels and drifts get so hot that the men cannot do half as much work as they can a few hundred ft. above, it will be seen how great a factor the temperature is in a question of profit. We gave, a few weeks ago, a table showing the relative increase of temperature with depth in the Forman shaft on the Comstock. The showing there made was that the increase was gradual but sure. Of course, the temperature in drifts and levels and in all underground workings depends, to a great extent, on the facilities of ventilation and the means employed for obtaining a good supply of air. The normal temperature of the works at certain depths is the important feature, and it was this that the record we published of the Forman shaft gave.

This subject has been considered worthy of careful investigation by the British Association, and a committee consisting of the following eminent men has had the subject in hand: Prof. Evarett, Prof. Sir Wm. Thomson, Mr. G. J. Symons, Prof. Ramsay, Prof. Geikie, Mr. J. Glaisher, Mr. Pengelly, Prof. Edward Hull, Dr. Clement Le Neve Foster, Prof. A. S. Herschel, Prof. G. A. Lebour, Mr. A. B. Wynne, Mr. Galloway, Mr. Joseph Dickinson, Mr. G. F. Deacon, Mr. E. Wethered and Mr. A. Strahan.

The 14th report of this committee contains some facts of interest in giving the observations of Mr. E. Garside, M. E., on East Manchester coal field: In Ashton Moss colliery the temperature was observed on June 27th at the depth of 930 yards, and found to be 85.3°, the thermometer being inserted in a hole two inches in diameter and three and one-half ft. deep, drilled for the purpose in hard blue shale which lies below the Great mine coal seam, being newly-opened ground, dry and free from cracks. The hole was allowed to stand 10 or 15 minutes that the heat of drilling might partially escape, and one of the committee's slow action thermometers was then inserted with proper plugging, and left in for six hours. It was not considered advisable to leave it longer as, "owing to the great crush and unsettled state of the ground," there might have been difficulty in extracting it. Up to the time at which the thermometer was withdrawn no disturbance of the solidity of the ground had occurred. The tunnel, and especially this part of it, was free from the action of any strong air-current. Assuming 49° as the surface temperature, we have here an increase of 36.3° in 2,790 ft., which is at the rate of 1° in 76.9 ft. Earlier observations were taken at the depths of 871 yards and 897 yards, by the colliery engineer; but Mr. Garside reports that the thermometer with which they were taken was an ordinary cheap one with wood scale, and that on examination the tube was found to be a little loose in the scale. It seems best, therefore, to neglect them as unreliable. In reference to an apprehension which was expressed, that the heat of drilling had not had sufficient time to escape, Mr. Garside writes that he has, on several occasions, made a second observation in the same hole in places where he knew that the strata would stand and not crack, and he has always found the temperature unchanged; but that it is impossible to repeat the observation at such great depths as that of Ashton Moss, as in a few hours the holes became crooked. Mr. Garside's next observation was at Bredbury colliery (in the county of Cheshire), and at the depth of 340 yards. A hole was drilled, as before, in dry warren earth (an argillaceous rock) free from cracks or water, in New Mine south level; and the temperature, observed as before, was 62°. Assuming (as above) 49° as the surface temperature, we have here an increase of 13° in 1,020 ft., which is at the rate of 1° in 78.5 ft. The distance from Ashton Moss colliery is three or four miles, and the two shafts are sunk through the same coal measures, one being near the outcrop, and the other more on the deep. Making no assumption as to the surface temperature, but comparing the two observations with each other, we have an increase of 23.3° in 1,770 ft., which is at the rate of 1° in 76.0 ft. The consistency of these results is eminently satisfactory. On a subsequent date, Mr. Garside took the temperature at Nook pit, belonging to the Broadoak Colliery company, at the depth of 350 yards, in the floor of the Royley mine. It is in newly-opened ground, free from cracks or other visible irregularities, at the far end of the newly-opened north level. The depth of the hole, which was in hard warren earth, and the other conditions of observation, were the same as before, and the temperature observed was 62½° Fahr. Taking the surface temperature as 49°, this gives an increase of 13½ in 1,050 ft., or of 1° for 79 ft. All these stations, as well as Dukinfield, where Mr. Garside last year obtained results in good agreement with those now presented, are within a few miles of each other and close to the river Tame, which is here the boundary between Lancashire and Cheshire. Mr. Garside calls attention to the great quantity of water which is found in some parts of the rock overlying the coal measures in this district, a source which is largely drawn upon for water supply, and suggests, with much show of reason, that its presence may account for the slowness of the rate of increase shown by all these observations.

Production of the Precious Metals.—No. 10.

[An abstract of the Census Monograph on the Bullion output of the country.]

NORTH CAROLINA—Production of Placer Mines for the Year Ending May 31, 1880.

County.	Gold.
Montgomery	$1,291
Pope	396
Total	4,687

SOUTH CAROLINA—Production of Deep Mines for the Year Ending May 31, 1880.

County	Gold bullion produced from ore raised and treated during census year.
Abbeville	$ 500
Colleton	6,000
Total	83,500

SOUTH CAROLINA—Production of Placer Mines for the Year Ending May 31, 1880.

County.	Gold.
Chesterfield	$6,541
Total	83,541

Silver Contained in Placer Gold.

No account is taken by the miners of the silver alloyed with placer gold, unless in the exceptional cases where the value of the former is allowed for in the sale of the product, as in direct sales to the mints or United States assay offices. In the aggregate this silver forms a considerable item, which should be included in the total product, but which has usually been disregarded by statisticians.

The schedules of the experts contain data for a close estimate as to the average tenor of the placer product. A statement of the fineness in gold of samples from various localities is appended:

Specimen Examples of Placer Gold.

County and Locality.	Fineness in gold.
CALIFORNIA.	
RUTH.	
Centerville	0.900
Cherokee Flat	0.970
Magalia	0.900
Morris Ravine	0.905—0.908
Oroville	0.942
CALAVERAS.	
Mokelumne Hill	0.850—0.960
DEL NORTE.	
Bunker Hill Mine	0.887—0.925
China Creek	0.900
Happy Camp	0.875—0.935
Indian Creek	0.900
Wingate Mine	0.944—0.950
EL DORADO.	
Placerville	0.980
HUMBOLDT.	
Gold Bluffs	0.940
Orleans Bar	0.726
PLACER.	
Bath	0.850
Dutch Flat	0.900—0.910
Gold Run	0.900
Iowa Hill	0.784—0.814
Michigan Bluffs	0.925—0.960
PLUMAS.	
Black Hawk Mine	0.924
Cook's Canyon	0.885
Gopher Hill	0.936
Hungarian Hill	0.924
Seneca	0.846
SHASTA.	
Igo	0.885
SISKIYOU.	
Callahan's Ranch	0.859
Cottonwood	0.860
Coyote Gulch	0.900—0.950
Galena Hill	0.930—0.930
Greenhorn	0.850
Humbug Creek	0.800—0.865
Indian Creek	0.835—0.900
McAdams Creek	0.750—0.900
Oro Fino	0.762
Rattlesnake Creek	0.827
Sawyer's Bar	0.850
Scad Valley	0.887—0.912
Scott Valley	0.806
South Fork Salmon	0.838
Yreka	0.749—0.863
STANISLAUS.	
La Grange	0.920
TRINITY.	
Buckeye	0.890—0.900
Canyon Creek	0.894—0.896
Chapman's and Fisher's Mines	0.914—0.917
Douglas	0.912
Indian Creek	0.920
Junction City	0.875—0.915
Red Hill	0.910—0.917
Trinity Center	0.900
Trinity Mine	0.887—0.903
Weaver	0.906—0.927
COLORADO.	
CHAFFEE.	
Hope	0.850
CLEAR CREEK.	
Jackson	0.880
LAKE.	
California	0.850—0.875
PARK.	
Alma Township	0.819
ROUTT.	
Hahn's Peak	0.666
SUMMIT.	
Bevan	0.750—0.820
Spalding	0.850—0.900
DAKOTA.	
LAWRENCE.	
Bear Gulch	0.940
Cape Horn	0.870
PENNINGTON.	
Canyon	0.925
Confederate	0.925—0.940
Jenny and Strawberry	0.940
GEORGIA.	
CHEROKEE.	
Fifteenth District	0.927
HALL.	
810 G. M. Ninth and Twelfth Districts	0.909—0.916
LUMPKIN.	
Twelfth District	0.875—0.995
Thirteenth District	0.962—9.992
WHITE.	
Fourth District	0.945
UNION.	
Tenth District	0.981
IDAHO.	
BOISE.	
Boise Basin and vicinity	0.7806
MONTANA.	
BEAVER HEAD.	
Bannock	0.935
DEER LODGE.	
Gold Hill	0.950—0.956
Henderson Gulch	0.925—0.957
Independence	0.725 0.730
McClellan's Gulch	0.860—0.930
Nelson	0.935—0.940
Summit Valley	0.700
LEWIS AND CLARKE.	
Last Chance	0.910
MEAGHER.	
German	0.830—0.835
Thompson's Gulch	0.945—0.980
OREGON.	
BAKER.	
Amelia	0.810—0.900
Bine Canyon	0.840—0.853
Chicken Creek	0.725
Humboldt Basin	0.783—0.863
Mormon Basin	0.750
Pocahontas	0.782—0.851
Rye Valley	0.726
Shasta	0.850—0.860
Willow Creek	0.825
CURRY.	
Sixes River	0.825

From the same aources the following condensed abstract has been prepared, showing the average fineness in gold and silver of the placer yield of several States and Territories, with the number of specimen examples from which these averages are derived. The amount of base metal contained in the crude bullion varies from nothing to 0.020.

Average Tenor of Placer Gold.

State or Territory.	Examples. Number of	Average fineness. Gold.	Silver.
California	80	0.8831	0.1124
Colorado	3	0.8205	0.1755
Dakota	7	0.9235	0.0725
Georgia	10	0.9228	0.0732
Idaho	413	0.7806	0.2134
Montana	14	0.8851	0.1009
Oregon	77	0 8727	0.1233
Total	600		

From 80 examples of California placer dust and bullion an average fineness of .8836 is derived, a proportion slightly in excess of that stated in Dana's "Mineralogy," where the fineness is quoted at .875 to .885, or an average of .880. It is possible that the census average is a trifle too high, owing to the natural tendency of producers to overestimate the fineness of their gold; but the slight difference between it and the figures given by Dana would not materially affect the general result.

The average for Idaho is 413 lots of placer gold from Boise basin, a district producing three-fourths of the total for the Territory. This gold is of less fineness than that obtained in several other localities in Idaho, but the average stated will hold as a close approximation for the total.

There are three methods of obtaining from these data an average for the United States—neither of which is quite free from defects.

If the sum of the figures representing the average gold fineness for the several States and Territories be divided by seven, the number of the States and Territories from which reliable data as to fineness are obtainable, the quotient is .871257, which may be described as an average of geographical distribution. This, however, does not represent the average fineness of the whole actual amount produced, for by this method each State and Territory is taken as an equal member in the calculation, without regard to the large difference in their several products. Thus, Georgia, with a product of $66,863, has as much weight in influencing the general average as California with a placer yield of $8,580,989, or 128 times as large.

Another mode is to give each individual example equal weight, disregarding territorial limits. Dividing the sum of fineness in gold of 610 specimen examples, 495,887, by 610, an average of .8129 is obtained. This gives a true average for the number of cases in which the fineness is definitely given in the schedules, but represents neither the average according to geographical distribution nor that of the whole product. In this way California, with a placer product nine and three-fourths times greater than that of Idaho, is largely overweighted by the latter, owing to the preponderance of examples furnished by Idaho in the census returns. The result is evidently too low.

The third and preferable method is to multiply the average fineness for each State and Territory by the coefficient of the several yields, and then divide the sum of the products so obtained by the sum of the coefficients. This gives each not an equal but a just weight. The result is the average fineness of the total product without reference to the producing source. This principle is thus applied:

State or Territory.	Average fineness in gold.		Yield of placer gold in millions of dollars		Resultants.
California	0.8836	×	8 681	=	7 5821716
Colorado	0.8205	×	0.102	=	0.0838910
Dakota	0.9235	×	0 051	=	0 0470985
Georgia	0.9228	×	0.007	=	0 0018276
Idaho	0.7806	×	0.880	=	0 6869280
Montana	0.8851	×	1 103	=	1.0410013
Oregon	0.8727	×	0 926	=	0 8081202
			11 770	=	10 3108382

$$\text{Total average gold fineness} = \frac{10\ 3108382}{11.770} = 0.87602$$

The proportionate contents in silver and in base metal are similarly ascertained. By using the figures representing the average tenor of the placer gold for each of the States and Territories for which reliable data are obtainable, and assuming the general average deduced from them for the cases in which the returns are defective, the probable total silver contents may readily be calculated. It is found that the 580,766.6 ounces of fine gold were associated with 80,177.3 ounces of fine silver and 2,753.2 ounces of base metal, making the total weight of the ornde placer gold 663,697.1 ounces. In mint value the silver contents were worth only $103,661 as against $12,005,524 for the gold. Thus while the ratio of silver to gold products was 1 : 7.2437 in weight, it was only 1 : 115.8153 in assay value. At the market rates the value of this placer silver, if any account were taken of it, would be considerably less, or a ratio of about 1 : 131. The loss to the miners in the price paid for the actual gold contents of the placer dust, when sold in small quantities to local dealers, is so much greater than the whole value of the silver contents, that the latter does not appear to them a matter of any consequence. The amount of silver alloyed with the placer gold of the several States and Territories is shown in the accompanying table:

Contents and Mint Value of Crude Placer Gold.

State or Territory.	Contents of placer gold. Fine gold.	Fine silver.	Base metal.	Total crude metal.	Mint value. Gold.	Silver.	Total.
	Ounces.	Ounces.	Ounces.	Ounces.	Dollars.	Dollars.	Dollars.
Alaska	287.0						
Alabama	11,451.7						
California	415,994.0	*30.4	1.3	*828.6	*8,600	*51	*8,651
Colorado	52,303.8	*783.5	*26.3	*1,556.6	*30,000	*257	*30,257
Dakota	1,092.3	1,870.1	4.4	963,697.1	8,580,989	68,271	8,649,260
Georgia	1,092.3	1,870.1	4.4	963,697.1	8,580,989	68,271	8,649,260
Idaho	5,038.3	9,591.2	205.4	51,348.1	104,150	1,295	105,445
Montana	2,460.3	4,683.6	1.0	*268.8	50,850	332	51,182
Nevada	42,552.8	11,633.1	227.1	54,512.9	879,645	15,040	894,685
North Carolina	56 255.6	6,341.4	221.4	62,818.4	1,162,908	8,199	1,171,107
Oregon	*2,418.7	*331.8	*11.0	*2,761.1	*50,000	*428	*50,428
South Carolina	*226.7	*31.1	*1.0	*258.8	*4,687	*40	*4,727
Utah	44,817.5	6,231.2	205.4	51,348.1	920,338	8,180	928,522
Washington	316.4	*43.3	*1.4	*361.2	6,541	*56	*6,597
Total	967.5	*132.5	*4.4	1,104.4	*20,000	*171	*20,171
	5,768.0	*788.4	*26.3	*6,582.7	*119,200	*1,019	*120,219
	580,766.6	80,177.3	2,753.2	663,697.1	12,005,524	103,661	12,109 18

*Estimated.

LEAD is worth $4 80 per hundred in New York. In this city $48 per ton is offered, but no sales are being made at this price.—*Salt Lake Tribune.*

NORTH CAROLINA—Production of Deep Mines for the Year Ending May 31, 1880.

COUNTY.	Ore raised during census year.	Average assay value per ton. Gold.	Silver.	Gold and Silver.	Assay value of ore raised during census year. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Davidson	20,200	17.50	2.50	20.00	350,000	*50,000	*400,000
Gaston	1,321						
Guilford	10						
Mecklenburg	11,370						
Moore	625						
Nash	60						
Rowan	1,200	*9 00	3.00	12.00	10,800	3,600	14,400
Stanley	500						
Total	35,786				360,800	53,600	414,400

COUNTY.	Ore raised and treated.	Average yield per ton. Gold.	Silver.	Gold and silver.	Bullion produced from ore raised and treated during census year. Gold	Silver	Totals.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars	Dollars.
Davidson	200	10.00		10.00	2,000		2,000
Gaston	1,321	5.00		5.00	9,107		9,107
Guilford	10	28.70		28.70	287		287
Mecklenburg	11,370	8.33		8.33	94,770		94,770
Moore	625	7.84	0.16	8.00	4,900	100	5,000
Nash	60	20.07		20 07	1,204		1,204
Stanley	500	4.00		4.00	2,000		2,000
Total	14,586	7.83		7 83	114 268	100	114,368

COUNTY.	Ore raised and not treated.	Assay value of ore raised during census year and remaining on hand at close of year. Gold.	Silver.	Total.
	Tons.	Dollars.	Dollars.	Dollars.
Davidson	20,000	*350,000	*50,000	*400,000
Rowan	1,200	10,800	3,600	14,400
Total	21,200	*360,800	*53,600	414,400

*Estimated.

VIRGINIA—Production of Deep Mines for the Year Ending May 31, 1880.

COUNTY.	Ore raised during census year.	Average assay value per ton. Gold.	Silver.	Gold and Silver.	Assay value of ore raised during census year. Gold.	Silver.	Total.
	Tons.	Dolls.	Dolls.	Dolls.	Dollars.	Dollars.	Dollars.
Buckingham	74						
Culpeper	90	40.09	1.40	41.49	3,608	126	3,734
Total	164				3,608	126	3,734

COUNTY.	Ore raised and treated.	Average assay value per ton—gold.	Gold bullion produced from ore raised and treated during census year.	Ore raised but not treated.	Assay value of ore raised during census year and remaining on hand at close of year. Gold.	Silver.	Total.
	Tons.	Dollars.	Dollars.	Tons.	Dollars.	Dollars.	Dollars.
Buckingham	74	5.00	371				
Culpeper	5	35.80	179	85	3,408	122	3,530
Total from schedule data	79	6.96	550	85	3,408	122	3,530
Additional production shown by mint receipts			8,772				
Total			0,322	85	3,408	122	3 530

DOUGLAS.

Big Bend	0,925—0 950
Canyonville	0.900—0.956
Green Mountain	0.825—0.830

GRANT.

Canyon City	0.850—0.900
Granite	0.750—0.791
Marysville	0.805—0.887
Rock Creek	0.857
Trail Creek	0.850

JACKSON.

Applegate	0.850
Ashland	0.846
Coyote Creek	0.895—0.930
Dry Diggings	0.875
Fort Lane	0.870
Forty-nine	0.837
Grass Creek	0.875—0.900
Jackass Creek	0.910
Jacksonville	0.890
Sam's Valley	0.825
Sardine Creek	0.810—0.900
Sterling	0.826—0.908
Uniontown	0.801—0.820
Wolf Creek	0.923

JOSEPHINE.

Althouse	0.865—0.875
Canyon Creek	0.900
Grass Creek	0.909—0.930
Illinois	0.900
Josephine	0.900
Murphy	0.900
Silver Creek	0.900
Waldo	0.910—0.927
Yank	0.967

UMATILLA.

Columbia River	0.740

WASCO.

Ochoco	0.711

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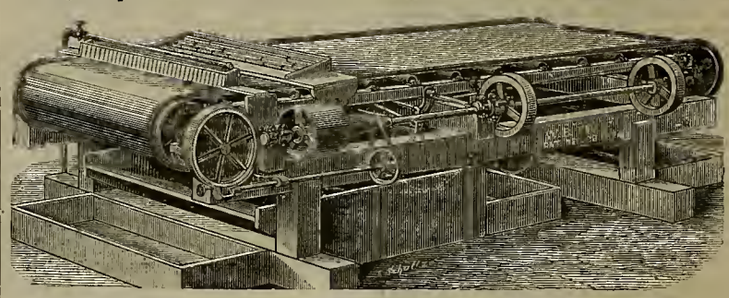

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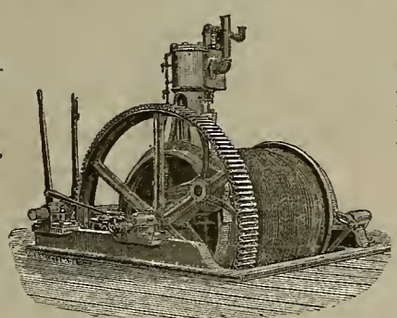

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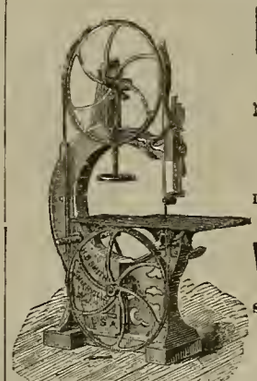

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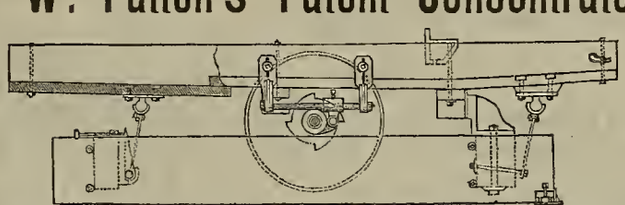

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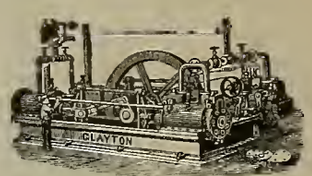

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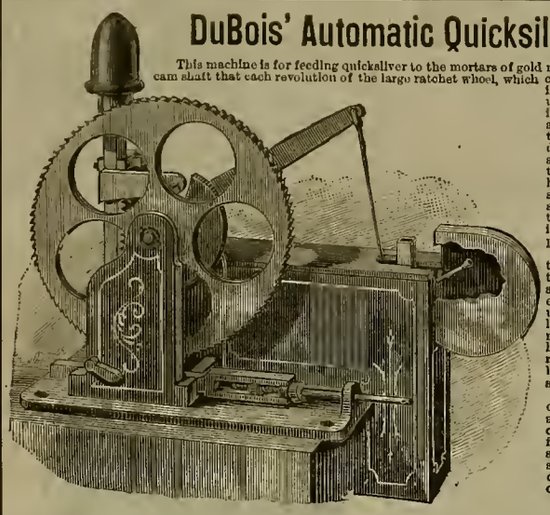

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING MAY 16, 1882.

257,992—THRASHING MACHINE—Henry N. Dalton, Oakland, Cal.
257,997—CARPET SWEEPER—B. Flger, S. F.
258,049—OIL CUP—John E. Gilligan, Elko, Nevada.
257,940—SEWING MACHINE—George Grisel, S. F.
258,063—BUCKBOARD WAGON—F. A. Hill, Benicia, Cal.
258,064—PLOW—F. A. Hill, Benicia, and M. J. Church, Fresno, Cal.
257,943—ELEVATOR—Philip Hinkle, S. F.
258,100—MACHINE HAND ROCK DRILL—Eugene Moresu, S. F.
258,120—METAL PLANING MACHINE—John Richards, S. F.
258,121—ENGINE LATHE—John Richards, S. F.
258,122—PIPE MOLD—L. Richsrdson snd F. J. Nettleton, San Gabriel, Cal.
258,131—CONCENTRATOR—John F. Sanders, Ogden, U. T.
257,985—ARTIFICIAL FUEL—Wm. C. Siffken, Victoria, B. C.
257,960—FISH WHEEL—Wm. R. McCord, East Portland, Oregon.
257,975—GOVERNOR FOR PUMPING ENGINES—Geo. C. Phillips, Silver City, Nevada.
257,976—DIRECT ACTING ENGINE—George C. Phillips, Silver City, Nevada.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

The Lane Mineral Springs.

The Lane Mineral Springs, owned and managed by Mr. James Hutchins, are located in the northeast corner of Calaveras county, six miles northwesterly from Knight's Ferry, Stanislaus county, the present post office address. The springs can be reached by Lane's Springs stage, starting from Commercial hotel, Stockton, on Tuesday and Saturday mornings. Mr. Hutchins meets passengers with his own conveyance at Knight's Ferry, during the season, on Tuesdays, Thursdays and Saturdays. Guests can arrive any day (except Sundays) from Milton, the terminus of the Stockton and Copperopolis railroad, by biring a private conveyance, some 13 miles to the springs. Copperopolis, famous in early copper mining days, is situated within seven miles north of the springs. Telegraph City is four miles, the once famous Napoleon copper mine, 2½ miles distant. They were discovered by Major Thos. Lane over 20 years ago, and have been visited as a place of resort ever since. Their altitude is 1,000 ft. The climate being favorable, guests are accommodated during all seasons of the year. They are heat known hy the people of Calaveras and adjoining counties, with whom they are in high favor by those who have tested their qualities and observed their remarkable and salntary effects. The water is cool and refreshing, and to most tastes quite palatable. From the reputation it hears, the water may be rated as second to none in its beneficial and curative qualities for pnlmonary complaints. It is also considered superior in cases of catarrh, rhenmatism, asthma, paralysis, and dyspepsia, liver, kidney and nervous diseases.

The climate is markedly dry during comparatively a large portion of the season, without being excessively warm. This arises, perhaps, from the fact that it is situated, as it were, on a point of rolling foothills, hounded on different sides by the vast plains of the San Joaquin valley. Fogs are infrequent visitors, and only in the wet season. The sea air, sweeping across the broad valley, seems to be favorably acted upon by the golden rays of a California sun, nntil it possesses rare desiccating and health-restoring qualities. Upon reaching the hase of the Sierras, it evidently heoomes tempered witb mountain atmosphere sufficient to make it more agreeable and consequently kindly in effect upon the human system.

Gnests can comfortably visit these springs considerably earlier and later in the season than most other resorts in the central and northern portions of the State.

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We will pay 10 cents a copy for the following numbers of the MINING AND SCIENTIFIC PRESS: Volume, 13; year, 1866; number, 1. Volume, 18; year, 1869; number, 5. Volume, 20; year, 1870; numbers, 1 and 26. Volume, 22; year, 1871; number, 1. Volume, 30; year, 1875; numbers, 2, 3, 4, 7, 10, 11, 12, 13 and 15.

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HOW TO STOP THIS PAPER.—It is not a difficult task to stop this paper. Notify the publishers by letter. If ic comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

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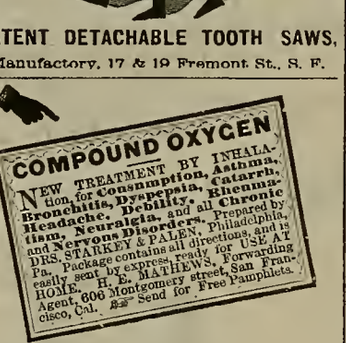
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Notice is hereby given that at a meeting of the Board of Directors, held on the 28th day of April, 1882, an assessment (No. 29) of Fifty dollars ($50) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 109 California street, Room No. 13, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the fifth day of June, 1882, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the third (3d) day of July, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. WM. BLACKWOOD, Secretary.

Office—No. 109 California street, Room No. 13, San Francisco, Cal.

ASSESSMENT NOTICE.

Gould & Curry Silver Mining Company.

ASSESSMENT, NO. 42.

Levied	May 23, 1882
Delinquent	June 29, 1882
Day of Sale	July 20, 1882
Amount per Share	Fifty Cents per Share

ALFRED K. DURROW, Secretary.
Office—Room 20, Nevada Block, 309 Montgomery St.

DIVIDEND NOTICE.

OFFICE OF THE
EUREKA CONSOLIDATED MINING CO.

Nevada Block, Room 37, San Francisco, Cal., May 15, 1882. At a meeting of the Board of Directors of the above named Company, held this day, a dividend (No. 73) of Fifty Cents (50c) per share was declared, payable on Saturday, May 27, 1882. Transfer Books closed until the 28th instant.

P. JACOBUS, Secretary pro tem.

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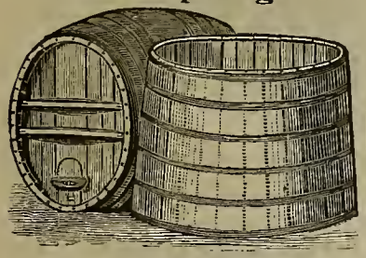

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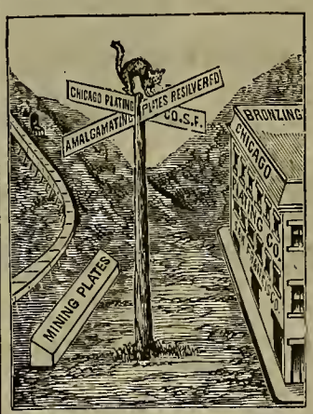

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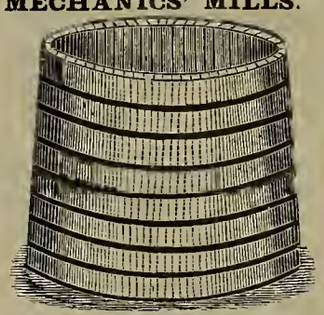

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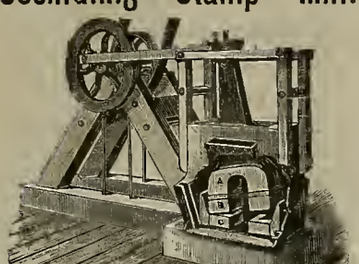
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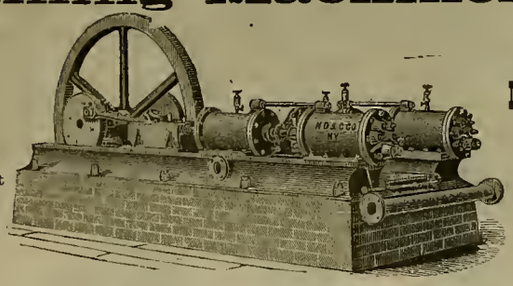

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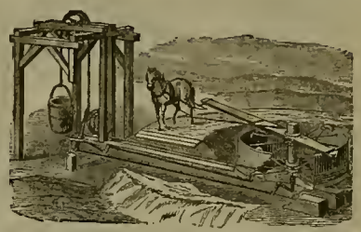

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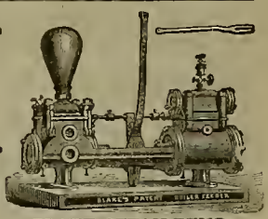

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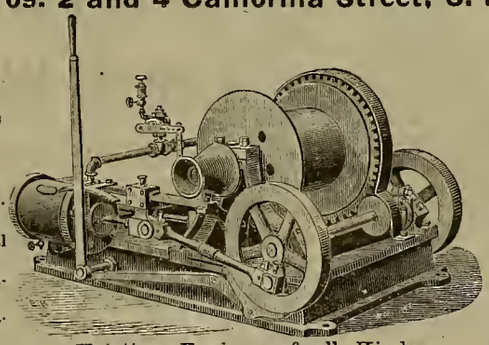

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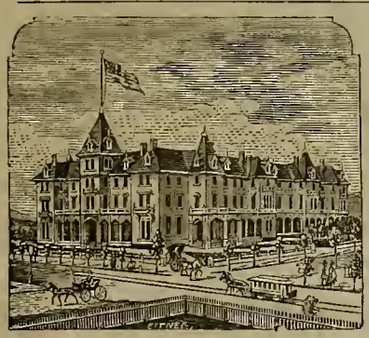

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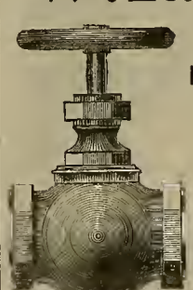

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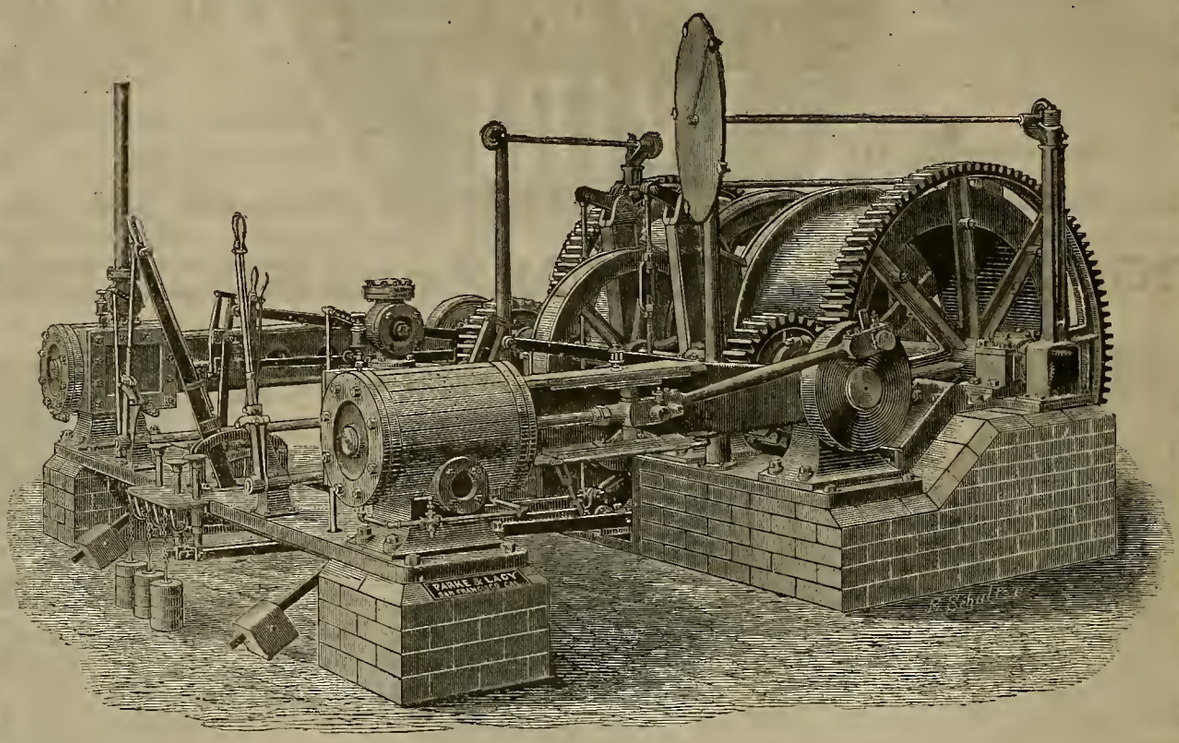
Portable Hoisting Engines—Kendall & Roberts'.
Improved Blowers—Baker & Root's.



Pressure Blowers—Sturtevant's.
Inspirators—Hancock's.
Hoisting Engines—Niles.
Fire Extinguishers—Babcock's & Champion.
Chemical Engines—Babcock's.

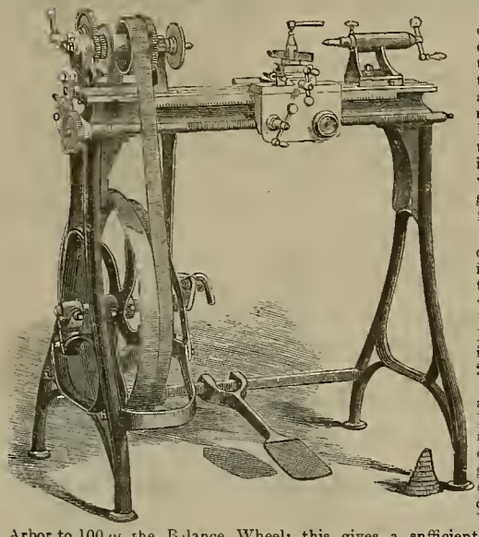
Hook and Ladder Trucks,
Farmers' Electro Battery, and Hill's Exploders.
Governors—Waters'.
Stowe's Flexible Shaft.
Leffel's Double Turbine Water Wheel.

PAIR "12 X 18" DOUBLE GEARED HOIST.

WOOD WORKING MACHINERY, MANUFACTURED BY THE H. B. SMITH MACHINE COMPANY,

And HAZARD STEEL Ropes and Cables.

SCREW CUTTING LATHE.



This cut represents a new screw cutting Foot Lathe which was put on the market about two years ago to meet the demand for a first-class tool at a low price, which will do a great variety of work, both in metal and wood, and is the best Lathe made, considering its capacity and price. The cut gives a good idea of its appearance, and below we give dimensions of parts and general description.

Description of Lathe, 4 ft. Bed.

The Lathe occupies a floor space of 28 by 48 inches, the centers being 44 inches high from the floor; the bed is 48 inches long, 6½ inches wide, 5½ inches deep, with double Vs. for Carriage and Tail Stock. It swings 10 inches over bed and 6 inches over carriage, and will turn 26 inches long.

The Head Stock is back geared, and the Cone has three speeds for 1¾ inch belt, the smaller being 3 inches diameter, the larger 6 inches diameter; this, with the back gears gives six different speeds, the fastest giving about 1,000 revolutions of the Arbor to 100 of the Balance Wheel; and the slowest, 75 of the Arbor to 100 of the Balance Wheel; this gives a sufficient range for all kinds of work.

The Arbor in Head Stock has a ⅝ inch hole through it, which is very convenient for turning the ends of long rods, making small screws, studs, &c. The Centres are ½ inch diameter. There is an attachment in Head Stock for reversing the motion of Carriage.

The carriage has a rack and pinion for moving it by hand, and a split nut moved by a cam on the face of Carriage to throw it in gear with screw; the reversing motion is in Head Stock.

The Tool Post has a slot for tools ⅜x1⅛ inches; the tool is adjusted by a wedge made on the arc of a circle and fitted to a convex washer. The leading screw runs the whole length of Lathe, and has 10 threads to the inch. A set of gears go with the lathe which will cut all common threads and a great variety of other sizes by compounding them; there is a screw stop on the Carriage for screw cutting, &c.

The Tail Stock can be set over for turning tapers, &c. The spindle of Tail Stock is 1 1-16 inches diameter, and has a motion of 3 inches. The center is fitted to a taper hole, which is the method adopted by all the best makers, and is the same size as the one in Head Stock, so that chucks and other tools fitted to one can be used in the other.

The Foot Motion, we consider the best made, the crank is adjustable and the shaft has swivel bearings; the balance wheel is 22 inches diameter and has 3 speeds to match Cone on Head Stock.

Send for Circular on Lathes.

Dunham, Carrigan & Co.,

107, 109, 111 Front St., and 108, 110, 112 Pine St., San Francisco.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JUNE 3, 1882.

VOLUME XLIV Number 22

Consolidated Claims.

By the act of July 9th, 1870, it was declared that no location of a placer claim should exceed 160 acres, whatever might be the number of locators associated together, or whatever the local regulations of the district.

In November of the same year the Commissioner of the General Land Office rendered a decision, that where several placer claims had been surveyed for an individual or company holding the possessory right thereto under the local laws, there was nothing to prevent the patenting of the several tracts or parcels of mineral lands thus surveyed as a single entry. This was not intended to be understood as authorizing the joint entry of parcels or claims situated at wide distances from each other in different land or mining districts, but simply to enable individuals or companies holding several placer claims in the same neighborhood, though not contiguous, to effect their entries and have their rights adjudicated with as little expense as possible. It was also decided at the same time, with regard to the matter of newspaper publication in such cases, that one notice might include a description of all the tracts or parcels desired to be entered by an individual or company holding the same. It was only required that the notice should give a sufficiently accurate description of each tract applied for as would enable other parties in the neighborhood to tell readily what mineral grounds were sought to be patented.

It was also decided, in 1875, by the Commissioner of the Land Office, that an unincorporated association of citizens owning separate and distinct interests in a placer mine might unite their means, and expend the $500 required by the mining laws at one point, and thereafter secure patent from the United States.

These decisions or rulings have always been considered as good law until recently. Having been held, as stated, that different interests could be consolidated in applying for patent, it has been held, too, that different locations consolidated in one claim under one ownership or interest, that claim could be patented in one piece without proving up, or all the different locations incorporated in the one claim.

The important mining decision rendered by Justice Miller, in the Circuit Court for Colorado, was recently referred to as having reached the point of final review by the United States Supreme Court, is to the effect that no mineral land patent can be legally issued for more than 160 acres, and that if a number of original locations have been consolidated into one claim, each of the locations must be treated as a distinct claim and advertised and proved up, with proof and separate work upon it. This decision, if sustained by the Supreme Court, would, it is said, destroy two-thirds of the patents heretofore issued for mining claims, and make the securing patents for most of the old claims impossible, because of the impracticability of making proof of old locations, and because, in most instances, separate work has not been done on the old locations which have been consolidated into larger claims. Thus a shaft sunk into a consolidated claim has been held for work done in every part of it, but the Circuit Court judgment overthrows that principle. The appealed case has been twice argued in the Supreme Court, and its forthcoming decision is awaited with great interest.

A GOOD OUTLOOK.—The mining districts in the vicinity of this city, Silver Glance, Mountain House and Sweetwater, are showing some excellent properties, which are sure, before the close of the year, to attract the attention of capitalists. Many of the mines in those districts are now being uncovered by their owners, and at a depth of only a few feet show astounding richness.

MR. WM. P. PENRY, editor and publisher of the Amador *Dispatch*, called on us on Monday. He represents mining prospects as being good in various parts of the *Dispatch's* local jurisdiction.

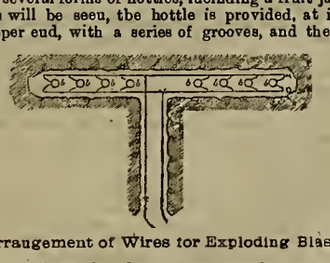
Cushion Protector for Bottles.

An ordinary bottle protector is a rubber band or cord resting in a groove encircling the bottle. In this class of protectors, like bottles have been made with the groove for containing the rubber cushion in the same relative position. By this construction, when the bottles are packed, the packing rings of contiguous bottles abut against each other, and the two bottles would be separated by the projecting portions of two packing rings, thus occupying much more space than is necessary.

Mr. James M. Thorpe, of San Jose, has recently patented, through the MINING AND SCIENTIFIC PRESS patent agency, a cushion protector for bottles, which overcomes the objections heretofore held against this class of articles. It consists in a bottle provided with a series of grooves or holding devices near its upper end, and of adjustable packing rings, which admits of the packing rings being readily placed on contiguous bottles, at varying elevations, so that they will not abut against each other.

THORPE'S CUSHION PROTECTOR FOR BOTTLES.

The engravings show the invention as applied to several forms of bottles, including a fruit jar. As will be seen, the bottle is provided, at its upper end, with a series of grooves, and there



Arrangement of Wires for Exploding Blast.

is a similar series of grooves at the lower end. A cylindrical rubber ring is passed over the bottle and sprung into one of the upper grooves, and a like rubber or other elastic ring placed in one of the lower grooves. The series of grooves admits of the elastic rings being readily changed on contiguous bottles at different elevations, and this prevents them from abutting against each other, and much economy of space in packing is the result.

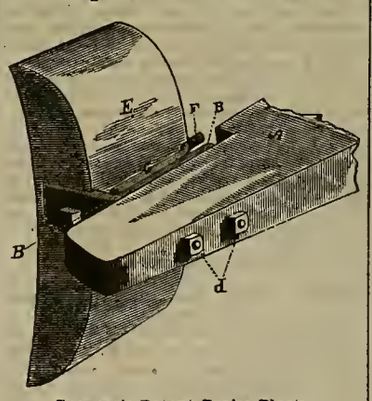
This method of protecting bottles requires no experience or skill. The bottles are, of course, packed in very much less space than in the old-fashioned way. This system is much cleaner, as it does away with the usual litter and confusion always attending the packing or unpacking in the old method, which for packing establishments is quite an advantage, lessening the risk they run in fires, thereby being quite a gain from an insurance point of view.

This cushion protector in no way interferes with or hides the labels, and the same device is ready for use over and over again. In shelving or storing in bulk there is no danger of breakage from careless handling; and in case of breakage of bottles from fermentation of contents the moisture is not absorbed and retained as in the case where straw protectors are used. Importers and exporters and dealers in wines, liquors, bitters, ales, porter, patent medicines, liniments, chemicals, fruits, candies, etc., will readily see the advantages this new system has over the old method in vogue. Joseph A. Belloli owns an interest in the patent with Mr. Thorpe, and parties desirous of further information, or of purchasing State rights, can address Thorpe & Belloli, San Jose, Santa Clara county, California.

Bank Blasting.

The following method of bank blasting has been found to give excellent results with banks from 50 to 125 ft. high, such as are generally encountered in hydraulic mining, and likewise in cement gravel of ordinary tenacity.

The main drift should be run in a distance two-thirds the hight of the bank to be blasted. The cross-drifts from the end of the main drift should be driven parallel with the face of the bank, and their lengths determined by the extent of the ground which is to be blasted. A single T is all that is necessary. The amount of powder required for charging the drift is from one-half to two-thirds of a keg of powder, minimum quantity, per 1,000 cubic ft. of ground covered by the drifts—*i. e.*, hight of bank × length of cross-drifts × length of main drift = cubic contents. The quantity of powder used must depend on and vary with the position of the bank and character of the gravel.



Spencer's Patent Brake-Block.

In charging these drifts the amount of powder used should be sufficient to blow out the bottom ground (the line of least resistance), the bank then falling by its own weight. The firing of all blasts is best done by electricity, and where the dynamite exploders with platinum wires are used, the compound circuit is most desirable.

The powder in boxes or kegs is piled up in rows in the drift. Two wires extend along the middle row, the tops of the boxes on which the wires rest being removed. The exploders, *b b b*, are inserted in powder cartridges and placed on top of the paper covering the powder. The wires are then connected with the wires which extend to the battery.

New Brake-Block.

The accompanying engraving represents an improvement on brake-blocks recently patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, by Edward G. Spencer, of Iowa Hill, Placer county. The patent covers an improved method of fastening the block to the brake-beam, whereby it it held securely, and may be readily removed when necessary.

A represents an end of an ordinary brake-beam used upon vehicles. Its inner edge is preferably notched out as shown, and against it lies a clamp or jaw, *B*, having its end turned at right angles. Upon the clamp, *B*, is another clamp, *C*, having its opposite end turned. The inner clamp, *B*, is provided with elongated slots, and the outer clamp has holes in it. Bolts pass from the inside through holes and slots in both clamps and through the beam, *A*, as shown, being secured by nuts on their ends.

The heads of the bolts are flattened and counter sunk, in order to preserve a flat surface upon the clamp, *C*. This arrangement allows the clamp, *B*, to slide within limits while holding the clamp, *C*, rigidly.

E represents the brake-block. Its head is provided with a transverse groove, and its sides are notched out to allow the clamps to fit therein. The block is fitted between the clamps, its back lying closely against the clamp, *C*. A bolt, *F*, is passed loosely through the outwardly turned end of the clamp, *C*, through the groove in the block and through the turned end of the clamp, *C*, on which screw-threads are provided for the screw end of the bolt.

The fastening of the brake-block is accomplished as follows: The bolts through the beam are first loosened, and the adjustable or sliding clamp, *B*, draws out, to allow space enough between the ends of the clamps to insert the brake-block. This is fitted between the clamps, their ends lying in the notched sides of the block.

The bolt, *F*, is then screwed up, forcing the sliding clamp inward until both clamps hold the block as tightly as desirable. The nuts on the bolts through the beam are then screwed up and the bolts tightened to hold the clamps in place.

When the brake-block requires to be removed, it is easily accomplished by loosening the bolts through the beam and unscrewing the bolt, *F*, when it can be knocked out. The notched sides of the block, held tight by the clamps, prevent it from working out.

Roasting Ores in Mexico.

In Mexico only the richer varieties of silver ores are smelted, the greater proportion, of course, being worked by the patio process, while in some few of the mining districts, barrel amalgamation is extensively resorted to. The ores which are to be smelted are, in some places, roasted in heaps, which is done by surrounding the mineral, broken into large lumps, with a layer of charcoal, retained in its place by an open wall of rough stone built in a circular form. The openings in this wall admit of the passage of the necessary amount of air, and the operation is completed in the course of 24 hours, with an expenditure of charcoal amounting to one-half the weight of ores operated on.

At Nieves the ores are roasted in circular kilns four feet six inches in diameter, and of about the same hight. These are formed of a bottom wall of adobe or sun-dried bricks, and are without a roof, the walls being so constructed that the area of the openings is nearly equal to that of the brickwork between them. Into each of these kilns are charged 2,000 lbs. of roughly broken ore intermixed with one-half its weight of dry wood. The operation requires a week for its completion, but this method of roasting can only be employed during the dry season.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Another Raid on the Congressional Mining Act.

A Voice from the Churchyard.

EDITORS PRESS:—Some 27 months ago a determined effort was made to legislate mining prospectors out of existence. Clarence King, who was then Director of the Government Geological Survey, was the main agent in that attempt, and having the Public Land Commission at his back, it looked at one time as if he might carry his point. But the conductors of the MINING AND SCIENTIFIC PRESS and its correspondents made such a vigorous resistance to the objectionable measure, and so many petitions against it were forwarded to Congressmen, that it was speedily abandoned.

Since then, peace and mining progress have been the order of the day. A much smaller man than Clarence King is now in the field to renew the fight which ended then, and openly declares, over his signature, that one of the results of his scheme will be a complete reversal of the prospectors' occupation.

In the *Engineering and Mining Journal* of May 13th, there appears a letter from Mr. John A. Church, Superintendent of the Tombstone Mill and Mining Co., headed, "Improvement in the Mining Law." It is accompanied by another letter on the same subject, from Elbert C. Van Blarcom, also dated at Tombstone. The two gentlemen staggering forward under such ponderous names are probably bold enough to think they are about to secure an easy victory. Mr. Van Blarcom, it may be, is only a sort of advance agent for his coadjutor. Perhaps Mr. Church requires his presence in the same way that a small boy having to go through a sighing pine grove at night likes to have a playmate, long to scare ghosts away by whistling.

That Mr. Church means business and has been looking up agents to help him, will be seen from the following editorial remarks, quoted from the *Engineering and Mining Journal* of last week:

"We print elsewhere two letters which deserve close study, because they take up a subject which must, at an early date, engage the full and earnest attention of the entire mining community. With a view to getting a full presentation of this subject in all its bearings, we invite our readers to discuss the points brought up. Mr. Van Blarcom's suggestions, we understand, have been submitted to men who have much weight in the councils of those who influence such legislation, and we believe have met with favorable consideration in some quarters. Prof. Church's remarks are the first of what we trust will be a series of communications on the subject. We shall spare no efforts to bring them to the notice of those who we believe have no other means of hearing the voice of many who have been instrumental in developing our mining industries. We purpose, should the interest in the matter warrant it, to gather these letters in pamphlet form, for greater convenience of distribution by those who have contributed to the series."

That the editorials and letters printed in the *Journal* will be all one-sided is to be inferred from the fact that two years ago its editors put every letter which opposed the Public Land Commission mining bill into the waste basket.

The points which Mr. Van Blarcom desires to see incorporated in a new Congressional mining law are the following: 1. Each mining district to have a Government mineral agent—if possible a mining engineer, but of necessity a surveyor. 2. This agent to go on the ground when a location is made, and decide on its validity, put up monuments, make a survey and charge the discoverer $15 as a fee; perhaps to take the claim as his own if the fee is not paid. 3. The mineral agent to certify as to assessment work done, and allure $7.50 from the prospector's pocket into his own. 4. Mr. Van Blarcom is willing to give the prospector five years, within which he must patent his ground; but "Professor-Doctor" Church is more drastic, and, crying out against the present law, declares that one year is a better probationary limit than five years. 5. No person is to be permitted to relocate his own claim, and the records of the mineral agent (whether he be honest or not) are to determine the point, if a given lode—not previously captured by himself for a song—is subject to relocation.

Such are the principal measures our poorly-informed Tombstone agitators proposed to place upon the national statute books. In future letters, Mr. Church will, no doubt, spread himself over a wider mining expanse than he has been able to cover in one effort; but he has gone far enough to show that if his and Mr. Van Blarcom's counsels are to be followed by our lawmakers, prospectors and miners of small means will have to leave the country, as Mr. Church, with a huge monopoly at his heels, struts forward to take possession of mines, out of which they have been deliberately robbed.

As a specimen of reasoning knowingly from a false hypothesis, few statements could be more "cheeky" than the opening sentence in Mr. Church's letter. Hear this Truthful James: "The propriety of replacing our present mining law by an enactment more exact and comprehensive seems to be generally acknowledged. Miners talk of it, papers discuss it, and Congress has invited suggestions from the knowing. The tendency of this opinion is, that some system should be found which would not be less liberal in giving than the present law, but more stringent in what is required from the beneficiary."

Toward the end of his effusion he says: "Probably the real opposition to a change would come from the complete reversal which a restrictive law would make in the prospector's business. But it is a question whether the time has not come for making such a change. Our liberal law has been a great help to prospecting; but its very liberality has developed evils which prevent the prospector from reaping the results of success with the certainty he would have if his title were more secure. The criticism of the present law comes largely from prospectors, and it is quite probable that they would be among the advocates for renewed legislation."

Mr. Church practically admits that the existences of the mineral States and Territories west of the Rocky mountains is due to the explorations of prospectors and pioneer miners, but as the country is pretty well run over now, and the class he so thoroughly detests seem determined to hold onto their mining claims until they can realize something for their time, toil and risk, it is necessary, in his estimation, to kick them out of the way, so that capital may come in and "gobble up" every lode of promise and, getting a patent on it, let it lie untouched for 20 years, until metallurgical processes are cheapened and miners are willing to work for two dollars per day. This is simply the plain English of Mr. Church's argument, there being no other logical outcome to it, when it is subjected to a reasoning process.

But what is it that has started Mr. Church on his windmill raid? It is not because he is a patriot and wishes to see our country prosper under good mineral laws. By no means. It is revenge he is seeking; he is in a rage because the Tombstone mining company, which gives him his bread and butter, has been defeated in a law suit with the Way Up mining company. The latter had a cross vertical ledge which ran into the Tombstone company's ground, and Mr. Church was extracting fine ore beyond his company's side line, on the assumption that he was following the lode on its dip.

These end lines, under our present law, are fatal to many well-laid schemes. Any miner or mining company desiring to do what is right will never object to that, or, indeed, almost any of its requirements, but to a trespassing, wealthy company, end lines are unmitigated evils. In the great contest between the Eureka Consolidated and Richmond mining companies, it was an end line that spoiled the high game of the latter. Then it was that Clarence King, who was the Richmond company's expert, dashed ahead, just as Mr. Church is doing now, to have the objectionable law modified. He failed in his efforts, as Church is certain to fail, simply because it is well understood that if any change in the existing law is attempted, more harm may be done in one direction than good in another.

I am sorry that this agitation has been forced upon the mining community. It is plain, however, from the above presentation of the case, that if no attempt is made to thwart the plans of Messrs. Church and Van Blarcom, the prospecting business will be quickly brought to an end. Mr. Church will do well to confine himself to his legitimate duties. With his knowledge, the Tombstone company has been paying large dividends while it owed $350,000. If this is the kind of morality which is satisfactory to Mr. Church, many people will be inclined to think he is a very unsafe adviser, either as to mining or any other kind of law.

I trust that our Pacific Coast Congressional Representatives will, by the pressure brought to bear on them from our widely extended mining camps, use such means as will soon put an end to the Church and Van Blarcom monopolizing speculations, and leave us our safe and nearly perfect mining law untampered with by wily hands. A PROSPECTOR.

Cochise County, Arizona, May 20, 1882.

Ancient Gravel Channels and Ridges.

EDITORS PRESS:—In the PRESS of May 13, 1882, page 306, by request of H. Clendennen, of Raudolph flat, Nevada county, you want to know "why ancient river channels follow ridges, and if the ridge is wide, there is none in the middle? And he challenges any man in the State to answer the question publicly in a few words." So we will be brief, and say that where the channel followed the ridge it was down grade at the time, so the water by gravitation ran that way and formed the channel. 2. That some wide ridges have channels in the middle, because streams once ran there. Mr. Clendennen appears to assume that the channels do run under and follow the line of ridges down; I will say this hypothesis is untenable and is not supported by facts, as regards the Pliocene river channels in this State. Because through all the principal ridges between middle Yuba and South fork of American river, nine tenths of the channels run across or diagonally under the lava cape, on an altitude of 2,500 to 4,000 ft. He says "if this were understood, it would be science to some purpose, and save millions of dollars." In answer, permit me to state that I have no control over people who have millions of dollars to spend foolishly. A. LARSON.

Dutch Flat, Placer Co. Cal., May 18, 1882.

Mariposa County Mines.

EDITORS PRESS:—Believing that you and your readers are interested in the mining developments of California, permit me, through your columns, to say a few words in reference to Mariposa county. Less than two years ago, Mr. M. Hulings, of Oil City, Pa., purchased the mines formerly known as the No. 9, but which Mr. Hulings named the Yosemite gold mines. At the time of purchase there was a 30-stamp mill just, or nearly, completed, with railroad from the mine, and other necessary arrangements to make a fair experiment of handling the low-grade ores, running from $5 to $40 per ton, which abound in this neighborhood. Mr. P. C. Dubois was placed in charge of the property, but failed to make a success of the enterprise. Mr. Hulings being heavily engaged in business in the East, could not give his personal attention; but after five months he returned here, to find that under Mr. Dubois' management the enterprise was a failure. Under the advice and assurances of Col. J. F. Thorn, a well-known gentleman of Mariposa county, the mill was started up with Mr. Thorn as superintendent; but, chiefly owing to the breakage of shoes and dies, the experiment was nearly a failure. Mr. Hulings, wishing to cast his lot in with the people of California in the enterprise, felt it the right thing to do to purchase his supplies in San Francisco, and of course his shoes and dies. The result has been, owing chiefly to the deficient character of the castings, being of a very brittle quality of cast iron, so much so that it often happened that a new set just put in at a cost, probably, of $400 or $500, would have to be taken out within 24 hours owing to breakage, so that to remedy the fault and difficulty, it became necessary to order steel from Pittsburg, which has been done with marked success. For three months the mill has been running with steel shoes and dies without a stop or break, yielding a nice profit. It is estimated that the loss Mr. Hulings has suffered from deficient castings has not been less, in the last nine months, than $20,000. Would it not be well for the manufacturers of such castings to give this matter a careful looking up? If the experience of others in this line has been in any way similar to Mr. Hulings', it surely would. Last fall Mr. Hulings, under the advice of his superintendent, purchased the Mt. Gains mine, in the near neighborhood. He placed machinery on the mine and entered on the work of development. The shaft has not yet been completed, but will be in the course of two months. These mines are known to be rich. The ore will mill from $10 to $40 per ton by free-milling process. Some weeks ago, Mr. Hulings purchased the Pool mines, a rich group lying one-half-mile south-west of his mill. These mines are yielding ores that mill $33 per ton. The whole group assure ores to supply a 30 stamp mill for half a century at least, and Mr. Hulings may now congratulate himself in the belief, well founded, that he has solved the problem of making a success of quartz mining in Mariposa county. He has been fortunate in securing the services of Col. J. F. Thorn as Superintendent, whose energy and intelligent care have largely contributed to the success of the enterprise.

The success of this enterprise is of vast importance, not only to this county, but to California, demonstrating the value of well-directed and intelligent energy in making our abundant quartz veins valuable, thus opening a wide field for capital, well directed, in mining in California. Messrs. M. Hulings & Sons are the sole owners of this immense property, and if they pursue the same liberal policy that has characterized the management under Mr. Thorn as heretofore, it will redound greatly to the benefit of this county and advantage to the people of this neighborhood. And it may here be remarked that the enterprise has the hearty support and good wishes of Mariposa county.

Hornitos, May 24th. C. C.

LEGITIMATE mining is just as honorable an industry as any other, but unfortunately scores of unscrupulous operators go into the business with no idea of ever digging anything out of the ground, but rely solely upon the dupes they can catch. When the press in the mining districts refuses to aid in bolstering up any enterprise that they know to be rotten, we may look for a change in the feeling in regard to mining matters in general. The $5 or $10 that the paper receives for bolstering up such skin games is poor pay for the loss of confidence that follows.

ALMOST PURE BULLION.—"Say, is that what you folks call ore?" asked a new arrival, the other day, of a prospector who was showing a specimen of a new find. "Yes," some one replied; "that is the way our ore runs here. It carries an average of 65 % galena, and over 100 ounces silver to the ton." "I shouldn't think you would call that kind of stuff ore." "What would you call it?" "Base bullion." And the stranger was right. Our galena ores are almost pure bullion.—*Wood River Times.*

Chloridizing and Oxidizing Processes of Copper Refining.

Two somewhat similar processes for refining impure commercial copper, such as Spanish or the Cobar copper of New South Wales—the one an oxidizing and the other a chloridizing process—have been patented by Mr. Claude Vautin, of North Fitzroy, Victoria. The oxidizing process now recognized as the ordinary method of removing these impurities, leaves a large percentage of them behind; but Mr. Vautin claims that his improved method either wholly removes them or reduces their percentage to a minimum. The ordinary method of oxidizing the impurities in commercial copper is to melt the latter, and then by stirring or rabbling it, to bring as much of it as possible into contact with the oxygen of the atmosphere. This, however, has proved to be a very imperfect process, and open to many objections. Mr. Vautin's process is either to force oxygen alone, or in combination with other gases (and preferably in the form of atmospheric air), throughout the whole mass, so as to oxidize the whole, or very nearly the whole, of the impurities at once, which impurities then rise to the surface and are skimmed off. As an alternative to the use of oxygen in a gaseous form, he substitutes oxygen-producing solids, and mixes them thoroughly with the mass of melted metal to be purified. Metallic oxides that yield up a portion or a whole of their oxygen under heat, will, when mixed with a suitable flux or re-agent, form such oxygen-producing solids. By way of example, he mentions that one part each of binoxide of manganese, of oxide of copper (copper scale), and of sesquioxide of iron (hematite iron ore) may be mixed with two or three parts of slacked lime or soda ash. Each oxide and its flux must first be ground and thoroughly mixed, and then the mixture should be thrown on the surface of the impure melted copper and thoroughly rabbled into or mixed with it, after which the heat should be raised in order to reduce the slag to as fluid a state as possible. When the slag is in a fit state it must be carefully removed, and the ordinary operations of poling and casting conducted as usual. Of these solid oxygen-producing materials, he prefers the mixture of oxide of copper and slack lime, and in the proportion of from two per cent. to three per cent. of the weight of the copper under treatment, and he prefers the use of the solid oxygen-producing materials to the gaseous.

The alternative, or chloridizing process, is of especial value where the copper to be treated contains bismuth. It consists essentially of such a use of chlorine as will bring it into contact with all the particles of the impure metal to be treated, with the object of taking up all the impurities and carrying them away in the form of volatilized chlorides. He accomplishes this in two different ways—either by forcing a current of chlorine or hydrochloric acid gas through, or into immediate contact with every particle of the impure melted copper, or by intimately mixing therewith a chlorine-producing composition, consisting of a chloride and its re-agent. The best example of such a composition is found to be produced by mixing one part of common salt (chloride of sodium), with from three to three and a half parts of slacked lime. Whatever may be the chlorides and re-agents constituting the composition, he first grinds and then thoroughly mixes the component parts, and thus uses the mixture; after the slag has been thoroughly skimmed off the copper under treatment, he introduces the mixture into the furnace, in the proportion of from two per cent. to three per cent. of the weight of the melted copper, and thoroughly rabbles or stirs it in, with the object of making it permeate the whole mass. He prefers to throw in this composition by degrees, so as to prevent the waste of the chlorine, and if this is done effectually, all, or very nearly all, of the impurities will be expelled in the form of volatilized chlorides. During this portion of the process the damper should be closed, so as to prevent any unnecessary waste of chlorine by the draught of the flue. When a current of chlorine or hydrochloric acid gas is used, it must be forced through or into intimate contact with the molten copper, and for this purpose almost any shaped vessel may be used, such as a crucible or a Bessemer converter. With respect to the second improvement, he prefers to apply the chlorine in the form of chlorine-producing compositions, of which a mixture of salt and slacked lime appears the best.—*London Mining Journal.*

COPPER SPINNING.—A comparatively new industry, that of copper spinning, has been introduced in Lawrence, Mass. A circular piece of sheet copper of ordinary thickness is placed on a lathe, and in a twinkling, without the use of hammers, sheare, rivets, or soldering iron, is spun into the shape of a kettle, without a break or weakening of a single fiber of the material. Ladies' and other utensils in copper and zinc, cuspadoree, etc., are formed in the same manner.

THE SAN FRANCISCO MINING AND SCIENTIFIC PRESS is one of the best, most interesting and instructive journals of its class published in the United States, and every mechanic, mine owner, miner and prospector should subscribe for it, as the cost is but $4 a year.—*Homer Mining Index.*

UTAH marble is now taking the place of Vermont for tombstones in Salt Lake. As the quarries open to depth, the quality improves.

MECHANICAL PROGRESS.

Cause of Variations in the Strength of Cast Iron.

Mr. James C. Stock, an extensive iron worker of 30 years' experience, thinks that the great difference in the strength of iron castings is mainly due to the form of the furnace and quality of fuel used in melting. He has furnished the following leaf from his experience, which we copy, substantially, from *Wood and Iron:*

I have found that the fuel used in melting is highly important. We are supposed to use nothing but the best brands of charcoal pig iron for making car wheels; we melt this iron with tiger anthracite, which takes away at least one-half the strength from the casting. This I know from practical experience. One case, among others, I will cite: Some years ago Capt. Norman Wiard started to make the best gun in the world. His plan, in time, will be adopted. I formed an acquaintance with the party who had charge of working the metal for the gun. The first thing in order was the strength of the iron; in experimenting for this we built a furnace after my plans. We then melted 500 lbs. of the Sallie Ann charcoal pig iron (using soft or bituminous coal for fuel) to the temperature required. This we called No. 1. Then we melted the same quantity of the same brand of pig iron, using anthracite coal for fuel, up to the same temper as No. 1; this we called No. 2. The samples were the same in shape, temper and weight. No. 1 stood a test of 32,000 lbs. to the square inch; No. 2 only stood a test of 16,000 lbs. to the square inch.

This will show that for all castings where strength is required, pig iron, melted and refined with the right kind of fuel, in a furnace like the one used in the testing for the Wiard gun, will give double the strength. I can give many other proofs, but this is one of the best I have personal knowlege of. I feel confident that other fuels can be used that will give even better tests. Iron is the king of metals, therefore it should be studied more than any other.

I have made a statement that the Wiard gun is the best. Then why did it fail? The cause was in the furnace. After the furnace was built and the charge of metal put in, I offered to make a present to the manager (as I never bet) first, that iron could not be refined, because he could not melt all the pig put in the charge for the gun; second, the gun would burst at the second or third test. I did not have to give either present.

How can you refine iron in a furnace where the metal, when in a melted state, lies often more than one foot deep? How can the carbon pass off? I have run a furnace from three to four hours, when the work could have been done in 40 or 50 minutes better, because the iron would be more fluid in the short time. You cannot get a true test of temper from the upper stratum of iron when in a melted state, as the carbon always sinks to the bottom. Now we know to a certain degree the quality of steel or wrought iron. Why cannot we trust castings the same way? One piece of casting should be the sample for thousands. I have known large shafting to break; we look for flaws or some other defect; then, if none be found, we make the casting larger; this often fails.

Castings should be made right in size, and light, yet strong. This could always be accomplished by using the right kind of iron, fuel and furnace. What I mean by the right kind of iron is that which is made from the best ores. We have the greatest variety and the best ores in the world; England must import almost all her ores for making steel; you cannot weld English cast malleable iron; therefore we could supply the world with shears and other work. We use Norway iron to make the wire rope; this should not be. In talking with the late John Roebling, of Trenton, N. J., he said we could make iron for his works in this country, as we have the necessary material.

SMOKE CONSUMPTION.—So complete have experiments proven the possibility and economy of consuming the smoke of furnaces that the city council of Montreal, one of the most conservative cities on the western continent, has passed an ordinance making it a misdemeanor, to be punished by fine or imprisonment, for any person to suffer or maintain upon his premises any fireplace or chimney, except the chimney of a private dwelling house, so constructed as not to consume the smoke arising from the fuel burnt therein; and every proprietor, owner or tenant of any engine, steam boiler, factory, chemical works, or other manufacturing establishment is to be compelled, upon notice from the inspector of boilers, to provide his furnaces with apparatus which will effectually consume the smoke escaping therefrom. Another regulation is added which is quite new, to the effect that the proprietor of any house or building hereafter erected, the chimney of which shall not be more than 12 ft. horizontally distant from any other chimney having a higher elevation, shall be bound at his own expense to carry his chimney at least six feet above the apex or roof of the building possessing the high chimney; and the proprietor of a high building erected beside a lower one already standing, shall carry up at his own expense all the chimneys of the lower house which are less than 12 ft. away from his to the same hight with his own.

Steel as a Structural Material.

At a recent meeting of the Institution of Civil Engineers, England, Mr. Ewing Matheson read a paper on "Steel for Structures," in which the present position occupied by steel, as compared with iron, as a material of construction, was dwelt upon at some length, considerable attention being, moreover, given to the question why, while steel was rapidly superseding iron for ships and boilers, it was so seldom used in bridge construction. Steel possesses the important advantage of a strength one and one-half to thrice that of iron, besides being much more elastic and ductile, and, owing to the method of manufacture, plates and bars of the usual kind can be made of steel in much larger pieces than is possible with iron, thus avoiding the numerous joints which smaller pieces involve. It was stated that the special treatment necessary for steel could soon be learned by workmen accustomed to iron, and present tools and machinery could be used for either metal. In regard to wasting by rust, sufficient time had hardly elapsed to prove positively the durability of steel as compared with iron, but at present it appeared as if the difference, if any, was in favor of steel.

Because of its greater strength, structures equal to iron could be made of less weight in steel; and in regard to ships, this saving allowed a corresponding increase in cargo-carrying capacity, or a reduced immersion. In boilers, plates, whether of steel or of iron, could not conveniently be of more than a certain thickness, and the working pressure was limited accordingly; but the superior strength of steel permitted a working pressure of steam one-third greater than in boilers of iron, thus allowing a saving in the space occupied for a given power, and greater economy in fuel.

There are several means by which the use of steel might be extended. The proper treatment of steel has now been thoroughly investigated, and the circumstances under which the metal is damaged, by punching holes and other manipulation, are well understood. But there we also need some ready means of verifying quality, this being far more necessary in steel than in iron, because in the latter, the range within which strength might vary is only one-sixth, whereas steel has a much wider range. Again, the mere fact that iron had been rolled into shape insured a certain minimum of quality, while if steel chanced to be bad, it might be one-half weaker than was wanted.

STORED ELECTRICITY.—The agents of the Light and Force company, of New York, an organization for the introduction of the Faure storage battery, arrived in New York May 12th, in the French steamship *Labrador*. They bring with them 80 large accumulators, or storage batteries, weighing 125 lbs. each and capable, when charged, of giving out power at the rate of one horse-power for one hour, or at any slower rate that may be required—one-tenth of a horse-power for 10 hours, for instance. They also bring 65 smaller accumulators, weighing 40 lbs., and capable of giving out one-third of a horse-power for one hour. All of these batteries were charged in Paris 10 days before the *Labrador* left Havre, and have not been recharged since. To illustrate the working of the invention on shipboard, and the effect on the machines by importation, the *Labrador* was supplied with the electric light on her way across, which continued until her arrival in this city. There were eight lights kept continually lighted, six of eight candle-power, one of six and one of 50 candle-light. Only one-sixth of the electric charge was found to be exhausted on the arrival of the steamer. Negotiations have already been made with Stephenson, the car-builder, for a number of tramway cars, which are to be run with the stored electricity, and before another year it is assured by M. Faure's representative that a locomotive will be in operation that can speed at the rate of 200 miles an hour, if desired.

MANGANESE BRONZE FOR PROPELLERS.—The twin screws of the new English iron-clad *Colossus* are of manganese bronze. This metal was adopted in place of gun metal, as first ordered, after a series of comparative tests which fully demonstrated its superiority. Under a steady pressure the gun metal broke with a strain of 28 cwt., while the manganese bronze bars required 54 cwt. to break them. Tested by impact, the gun metal bars broke with from seven to eight blows of a 50 lb weight; the manganese bronze broke only after 13 to 17 blows. The superior strength and toughness of the bronze permits a considerable saving in the weight of machinery, and also the use of a much thinner blade, offering less resistance to the water.

DURABLE MORTAR.—The London *Builder* attributes the marvelous durability of mortar in Italy to the fact that the lime remains in a pit covered with water for two years before it is used, whereas in England lime is slaked and used the same day. Most building specifications even require newly slaked lime.

AMERICAN LOCOMOTIVES FOR MEXICO.—The bark *Addie E. Sleeper* has been chartered to carry a full cargo of locomotives and freight cars and other railroad material from Philadelphia to Vera Cruz, Mexico. American locomotives are now used in almost every civilized country on the globe.

SCIENTIFIC PROGRESS.

Science of Value to All Men.

M. Quartrefages, in an address before the French Association for the Advancement of Science, at Bordeaux, thus emphasizes the value of scientific knowledge, not only for those who make it a specialty, but for all practical and intelligent men:

All men cannot be expected to enlist under the banner of professional science. But all may and must acquire scientific notions, sufficient at least to understand the utility of the intervention of special men, and to be able to judge when that intervention becomes necessary. Science is nowadays omnipresent, and tends more and more to become the sovereign of the world. What industry is there that does not want the help of the engineers, and would remain content with the progress already accomplished? What branch of manufacturers would decline the help of chemistry? What medical practitioner, worthy of that name, would consent to forsake physiology, that complex science, the offspring of chemistry, and would do without natural philosophy any more than anatomy? What intelligent agriculturist does not understand that the problems of culture and production are essentially questions belonging to zoology, botany, geology, and chemistry? And in this great city, one of the queens of universal commerce, what merchant would deny the importance of geography?

Science is as indispensable to the military man as it is to the manufacturer, the medical practitioner, and the agriculturist. I am not going to undervalue the share that, in war, falls to inspiration and gallantry. But inspiration must be enlightened by study, and courage must be aided by weapons equal in efficiency and power to those of the enemy. No more than the agriculturist or the manufacturer can the officer master all the sciences, the help of which is necessary to his profession. He cannot be expected to solve by himself all the problems raised by his single art. It is essential that he should first ascertain these problems, and confidentially appeal to scientific men, pointing out to them the application he wants. Let us, therefore, stir up the intellect of all men. Surely, we may hope to bring to light many treasures which, for want of the opportunities which it will be our object to create, might remain buried in the darkness of ignorance.

Our task will be fulfilled only when every man exercising any influence on his neighbor, or having any amount of leisure on his hands, shall have become an enlightened friend of science; when the least among laborers shall know what principles regulate the processes and the practice of his handicraft. Look at the results obtained in England by our eldest sister, the British Association. It is owing to its action that part of the population of England has undergone a transformation. The sons of fox-hunting squires are now geologists, philosophers, botanists, archæologists, etc. It is a banker who presides over the Anthopological Institute, and a brewer who is at the head of the Astronomical Society. The British Association reckons its members by thousands, and all the principal towns dispute the honor of its visits. Let us, then, begin our work with confidence; let us spare no efforts, for none shall be in vain. We know now that in the physical world there is no loss of matter. It is so, and even to a more absolute degree, in the moral world. Will is also a power that increases and multiplies by transforming the minds of men, like a ferment. We have the will for good; let us resolutely apply it, and we shall develop the intellects and raise the hearts of men by the diffusion of scientific knowledge.

A NEW TELEPHONE.—It is reported that a French gentlemen, M. Bottelier, has made a new telephone, which consists of a cylindrical copper box, about five inches in diameter and two inches high, in which the different parts are placed, and covered with a lid having a hole in the center. A mouth-piece is fixed near this opening, and the emitted sounds strike a vibrating plate screwed to the lid. The vibrations act on a magnet suspended to the sides of a box by three steel wires, the tension of which can be regulated at will. Owing to the elasticity of the wires the magnet may oscillate slightly in the same direction as the vibrations of the plate by which it is attracted, and as the magnetic action increases proportionally to the square of the distance, the amplitude of the oscillation increases until the tension of the wires, on the one hand, and the elasticity of the plate, on the other, equilibrate the attraction.

DANGER FROM SODIUM.—When, says the *Engineer*, an alloy of lead, tin or other metal is made with sodium in a melting pot, great care must be used in subsequently freeing that melting pot of every trace of sodium before using it for melting tin in, with a view to tinning copper or bronze articles; otherwise these articles, when placed in the melted tin, will be rapidly eaten away. This has been recently proved by accident, but it might have been expected from known facts concerning sodium alloys, which were long ago pointed out by Mr. Mallet, who showed, among other things, that if a strip of iron be coated with sodium amalgam and dipped into a pot of, say, molten tin, the iron will disappear faster than it can be put to the bottom of the pot.

More Scientific Prizes.

Mr. H. H. Warner, of the Rochester, N. Y., Astronomical Society, announces that, in consequence of the extra research resulting in valuable discoveries which attended his offer of prizes for astronomical discoveries last year, he makes a similar offer for the present year, as follows:

Prize First—The sum of $200 for each discovery of a new comet made in the United States, Canada, Great Britain or Ireland. The conditions are: First, it may be discovered either by telescope or the naked eye, but must be unexpected, except as to the comet of 1812, which may reappear during the year. Second, the announcement of the discovery must be made confidentially and exclusively (by telegraph) to Dr. Lewis Swift, director of the Warner Observatory, Rochester, N. Y., and to him alone, and he will cause the same to be immediately telegraphed, together with the name of the discoverer, to all parts of the world. Third, the telegram must give the time of discovery, the position, and direction of motion, if possible, sufficiently exact to enable at least one other observer to find it. Three disinterested astronomers will be selected by Dr. Swift to decide all disputed questions.

Prize Second—The sum of $200 for any meteoric stone found in any of the above countries during 1882, which Profs. Henry A. Ward, of Rochester, N. Y., Principal Dawson, of Montreal, Canada, and J. Lawrence Smith, of Louisville, Ky., shall unanimously decide contains fossil remains of animal or vegetable life, thus proving the inhabitability of other planets.

Prize Third—The sum of $50 for a specimen of any meteoric stone (whether it contain organic remains or not), seen to fall in the United States during 1882. Condition, a specimen (which shall become the property of the Warner Observatory) of not less than two ounces in weight, must be sent by mail to Dr. Swift, accompanied by a descriptive letter written in English, giving the time of its fall, depth of penetration in the soil, weight of the entire stone, direction of flight, and such other facts regarding it as will be of value to science.

As the result of the offer of last year, the discoverers of four of the comets of 1881 were each awarded the comet prize of $200, and Prof. Lewis Boss was also awarded $200 for the best essay on comets.

A PHOTOGRAPHIC GUN.—Muybridge must look out for his laurels. His instantaneous pictures of the movements of the horse have now been fully equaled by the efforts of M. Marrey, a French naturalist, in taking a photograph of birds on their flight. The difficulty in this effort was to keep the object in the field of the camera. To remove this difficulty this gentleman has devised what may be called a photographic gun. The barrel is a telescope—that is to say, it contains the lenses of a camera. There are 16 apertures which take the place of the chambers. The photographer puts in a sensitized plate behind these apertures, and performing an operation analogous to cocking the weapon, he is ready for the field. On seeing a flying bird he takes aim and pulls the trigger, the chamber revolves once, and in one second he obtains 16 little pictures of the bird in various positions. Hitherto, M. Marrey has made use of his photographic gun for the purpose investigating the flight of birds. In these cases, clearness of definition is of little consequence, so long as a dark image or silhouette the shape of the bird is obtained, so that it matters little whether the object aimed at be focused or not; but it is obvious that in a multitude of other cases the image can be obtained perfectly in focus. Indeed, it will be seen that the system of thus carrying a small camera to be steadied against the shoulder admits of extension, and may prove of the utmost service to the photographer.

SUN-SPOT PERIODICITY.—An important new fact regarding the sun-spots has been lately established by M. Spoerer from his own observations, together with those of Heis and Carrington. It is known that spots hardly ever appear on the equatorial zone of the sun, and they are never observed beyond a latitude of 51° in either hemisphere. It is between 6° and 35° that the sun-spot is chiefly concentrated. Now the fact referred to is a periodicity or oscillation of the following nature: The activity advances towards the equator, rising first to a *maximum* at 18°, then diminishing, as years pass on, till at 5° or 6° it seems to be exhausted, and disappears. Thereupon some cause brings out spots in the higher latitudes again, and the same advance towards the equator is repeated, with a *maximum* about 18°. M. Spoerer also finds a preponderance in production of spots to occur alternately in the two hemispheres; but this phenomenon is less pronounced than the other. The effects are apparently not explicable at present.

TRACINGS ON GLASS FOR THE LANTERN.—The following method, by George Smith, appears to be satisfactory. A piece of finely ground glass is rubbed over with a trace of glycerine, in order to make it as transparent as possible. It is now easy to write or draw on the prepared surface with a hard and finely pointed black lead-pencil, and the glass is so transparent that the finest details of any engraving, over which it can be placed, can be seen quite distinctly. The drawing having been finished, the plate is washed with water, in order to remove the glycerine, and dried. A thin coat of Canada balsam or of negative varnish now serves to render the slide permanently transparent and ready for the lantern.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending May 11.		Week Ending May 18.		Week Ending May 25.		Week Ending Jun. 1.	
Alpha	10c	....	50c	....	....	....	25c	....
Alta	1.90	1.45	1.55	80c	1	80c	70c	10c
Andes	70c	60c	60c	40c	50c	45c	45c	35c
Albion	1.95	1⅜	1.95	1⅛	1⅜	1.60	1.70	1.35
Argenta	10c	5c	15c	10c	15c	....	15c	....
Addenda	....	....	....	....	....	....	....	....
Belcher	40c	20c	45c	25c	35c	....	35c	25c
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	5⅜	5⅛	5⅛	1.10	4.95	4.15	4.40	3.50
Bullion	30c	....	30c	25c	25c	20c	20c	10c
Bechtel	30c	25c	30c	25c	15c	....	15c	....
Belle Isle	....	....	....	....	10c	....	10c	....
Bodie	5⅞	5⅜	5⅜	5⅛	5	5	5	4.95
Benton	50c	45c	45c	35c	30c	....	35c	5c
Bulwer	....	....	2.10	....	1.95	....	2	1.90
Boston	....	....	....	....	20c	....	....	....
Black Hawk	....	....	....	....	10c	....	....	....
Bodie Tunnel	....	....	1.20	....	1.10	1.05	1.20	1.05
Booker	....	....	....	....	....	....	....	....
Caledonia	....	....	....	....	....	....	....	....
California	25c	20c	25c	15c	20c	15c	20c	10c
Challenge	....	....	....	....	....	....	....	....
Chollar	60c	45c	55c	25c	40c	35c	35c	20c
Confidence	80c	70c	70c	65c	65c	50c	50c	....
Con Imperial	....	....	....	....	....	....	....	....
Con Virginia	65c	6 c	60c	40c	50c	40c	45c	30c
Crown Point	60c	50c	55c	40c	40c	....	40c	....
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	1.90	1.70	1⅞	1.30	1.95	1.85	2	1.95
E. Mt. Diablo	10c	....	10c	....	10c	....	15c	....
Eureka Con	21⅛	21	19⅜	19	18⅛	16⅜	16	15⅛
Eureka Tunnel	....	....	75c	60c	45c	....	25c	10c
Exchequer	25c	....	20c	10c	15c	10c	15c	10c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	....	15c	5c	10c	5c	10c	5c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	....	....	35c	....	25c	....	25c	20c
Gould & Curry	2.35	2.20	2.40	1.60	.90	1.60	1.70	1.30
Hale & Norcross	1.30	1.10	1.35	60c	70c	30c	60c	25c
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	10c	....	10c	....	10c	....	5c	....
Justice	40c	30c	35c	25c	25c	10c	15c	5c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	25c	....	25c	....	15c	....	20c	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	10c	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1¼	....	....	....	....	....	....	....
Martin White	4.30	4.05	3.90	....	3½	3½	3.80	....
McClinton	....	....	....	....	....	....	....	....
Meno	1⅜	1.20	1.30	1.10	1.15	....	60c	50c
Mexican	7⅞	6⅜	8⅛	4.95	5⅜	4⅜	5⅛	4.70
Mt. Diablo	4.10	3.85	3.80	3.60	4	....	4¼	....
Mt. Potosi	....	....	60c	5c	40c	....	65c	....
Noonday	1	90c	1	90c	1	95c	1	95c
New York	....	....	5c	....	....	....	....	....
Northern Belle	8	7⅜	6½	4⅜	7	6⅛	8	7½
North Noonday	1	95c	1	95c	1	....	90c	70c
Navajo	1.60	1.45	1.70	1.80	2¼	2.10	2⅛	2.15
Occidental	....	....	50c	....	50c	....	75c	50c
Ophir	3⅜	3⅛	3.35	2.55	3	2.45	3¼	2.55
Original Keystone	....	....	....	....	....	....	....	....
Overman	15c	10c	15c	10c	5c	....	5c	....
Oro	25c	....	20c	15c	15c	10c	20c	15c
Paris	....	....	....	....	....	....	....	....
Potosi	35c	25c	75c	25c	55c	45c	50c	40c
Pinal	....	....	2¼	2⅛	3	2.90	3.90	3.20
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.65	1.10	2.10	80c	90c	55c	55c	30c
Seg Belcher	....	....	5	....	2	....	....	....
Sierra Nevada	5⅛	6⅛	6⅛	5	6	5⅛	5⅞	5⅛
Silver Hill	10c	....	....	....	10c	....	10c	5c
Silver King	18⅛	18	18	17	17⅛	16⅜	16⅜	16⅛
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	80c	70c	80c	60c	75c	65c	70c	50c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	25c	....	....	....	10c	....
South Nevada	....	....	7⅛	6⅞	6⅞	6⅜	7⅜	7
Syndicate	....	....	....	....	15c	....	15c	....
Tioga Con	....	....	15c	....	15c	....	....	....
Tiptop	3⅛	....	3.20	3	....	....	2⅞	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	12⅛	10⅛	10⅞	8⅜	10⅛	9	9⅝	9
Utah	3	2.40	2.65	2	2.30	2	2.10	1.05
Ward	3⅜	....	....	....	3⅞	....	3⅜	....
Wales	50c	....	....	....	45c	40c	40c	....
Yellow Jacket	1	90c	95c	60c	75c	65c	75c	25

Sales at S. F. Stock Exchange.

Thursday A. M., June 1.

1750 Alta	25c	700 Savage	35c
440 Andes	35c	550 Scorpion	50c
200 Alpha	25c	360 Sierra Nevada	5⅛@5¼
320 B & Belcher	3⅛@3⅜	480 Utah	1.05@1.10
120 Belcher	25	510 Yellow Jacket	35@40
340 Benton	5c	AFTERNOON SESSION.	
100 Bullion	10c	300 Argenta	15c
710 California	15@10c	800 Albion	1.45
530 Chollar	20c	250 Belle Isle	10c
845 Con Virginia	30c	50 Concordia	1
50 Confidence	50c	725 Day	1.85@1.90
200 Crown Point	20c	150 Eureka Tunnel	35c
245 Gould & Curry	1.30@1.35	360 Mono	55
245 Hale & Nor	30@25c	50 Northern Belle	7⅜@7⅝
140 Justice	5c	300 Navajo	2.25
210 Kentuck	20c	100 Noonday	90c
100 Mexican	4.70@4⅞	100 N Noonday	85c
560 Ophir	2.35	990 Oro	10c
50 Occidental	50c	400 Pinal	3.40
505 Potosi	40c	100 Wales	50c

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Silver King, May 23, $15,000; Northern Belle, 22, $7,548; Christy, 25, $2,218; Eureka Con., 21, $9,881; Star, 22, $2,098; Bodie, 29, $10,802; Northern Belle, 25, $19,861; Bodie Tunnel, 30, $3 688; Contention, 27, $28,443.85; Christy, 30, $5,695; Eureka Con., 23 and 24, $9,138.08; Germania, 25, $4,000; Hananer, 25, $1,770; Horn Silver, 24, $25 000; Bullionville, 25, $1,958; Horn Silver, 27, $12,500; Frisco, 27, $4,179; Bullionville. 27, $1,813; Germania, 27, $2,000; Hanauer, 27, $1,750; Stormont, 27, $3,600.

SHIPPING ANTIMONY.—Supt. McCullangh, of the McCullongh Antimony and Copper Mining Co., has made arrangements to ship about 90,000 lbs. of antimony ore to San Francisco for reduction. The first carload will be shipped in a few days, and good returns are expected. The mines are situated in Cottonwood canyon, about eight miles southwest of Battle Mountain, and are prodncing excellent ore, about 60 tons now being on the dumps. The company is working eight men, and a good showing will be made in that vicinity this summer.—*Lander Fre. Press.*

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	NO.	AMT. LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Argenta M & M Co	Nevada	10	10 Apr 12	May 19	June 12	E M Hall	327 Pine st
Alta S M Co	Nevada	23	60 May 2	June 6	June 27	W H Watson	302 Montgomery st
Boston Con M Co	California	3	20 May 23	June 28	July 20	F F Luty	330 Pine st
Belcher S M Co	Nevada	30	25 Apr 14	May 17	June 5	J Crockett	327 Pine st
Belvidere M Co	California	13	25 Feb 9	Apr 12	June 8	C V D Hubbard	310 Pine st
Best & Belcher M Co	Nevada	23	50 Apr 5	May 11	June 2	Wm Willis	309 Montgomery st
Belmont M Co	Nevada	32	10 May 20	June 24	July 17	J W Pew	310 Pine st
Benton Con M Co	Nevada	8	20 May 27	June 13	July 20	Wm H Watson	302 Montgomery st
Bullion S M Co	Nevada	24	25 May 29	July 1	July 25	A J McDonnell	327 Montgomery st
California M Co	Nevada	3	20 Mar 29	May 6	June 5	G P Gordon	309 Montgomery st
Chollar M Co	Nevada	8	25 May 9	June 12	June 30	W E Dean	309 Montgomery st
Excelsior Grav M Co	California	18	25 May 4	June 6	June 23	D B Chisholm	327 Pine st
Fair Villa M Co	Arizona	1	2½ Apr 24	May 29	June 19	J H Sayre	330 Pine st
Gould & Curry S M Co	Nevada	42	50 May 23	June 29	July 20	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	74	50 May 16	June 20	July 11	J F Lightner	309 Montgomery st
Justice S M Co	Nevada	36	20 May 22	June 27	July 13	R E Kelly	419 California st
Martin White M Co	Nevada	12	25 May 9	June 20	July 20	J J Scoville	309 Montgomery st
Napoleon M Co	California	8	5 Apr 20	June 1	June 19	H Smith	307 Montgomery st
Overman M Co	Nevada	53	25 May 1	June 6	June 27	C D Edwards	414 California st
Potosi M & M Co	Nevada	8	50 Apr 12	May 16	June 6	W E Dean	309 Montgomery st
Quartz Moutain M Co	California	14	75 Mar 16	May 24	June 24	E Hestrea	729 Montgomery st
Savage M Co	Nevada	51	50 May 4	June 6	June 26	E B Holmes	309 Montgomery st
San Pedro G & S M Co	Nevada	5	10 May 10	June 12	July 10	W G Holmes	Sherman's Building
Scorpion S M Co	Nevada	12	10 May 25	June 29	July 21	Geo R Sphinxy	310 Pine st
Sierra Nevada M Co	Nevada	73	1 00 May 17	June 21	July 10	E L Parker	309 Montgomery st
Silver Hill Q M Co	California	2	25 Apr 12	June 10	July 10	J W Pew	310 Pine st
Villagrana M Co	Lower California	1	20 Apr 25	June 26	July 15	A Judson	320 Sansome st
Utah S M Co	Nevada	29	1 00 May 4	Juno 10	June 29	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Belle Isle M Co	Nevada	4	10	May 23	July 17	E M Hall	327 Pine st
Caledonia M & M Co	Nevada	12	25	Apr 5	May 13	June 15	W Letts Olliver	328 Montgomery st
Golden Fleece Grav M Co	California	25	30	60	Apr 15	May 20	June 8	F Sohrmeir	785 Folsom st
Grand Prize M Co	Nevada	8	10	May 2	June 5	June 26	E M Hall	327 Pine st
San Pedro G & S M Co	California	5	10	May 10	June 12	July 10	W G Holmes	Sherman Building
Santa Anuita M & M Co	California	3	03	Apr 17	May 22	June 12	J M Buffington	309 California st
South Hite G M Co	California	4	10	May 3	June 5	June 28	F A Berlin	420 Montgomery st
Tower Con M Co	Nevada	1	10	Apr 7	May 12	June 1	G W Sessions	309 Montgomery st
Western Home M Co	—	3	05	Apr 10	May 11	June 15	A Halsey	334 Montgomery st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Excelsior Grav M Co	California	D B Chisholm	327 Pine st	Annual	June 4
McElroy Grav M Co	California	N Sillic	607 Washington st	Annual	June 6
Tilden M Co	—	O Van Dyck Hubbard	310 Pine st	Annua	June 6

LATEST DIVIDENDS—WITHIN THREE MONTHS

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F	AMOUNT.	PAYABLE
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	June 12
Contention M Co		D C Bates	309 Montgomery st	25	May 28
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	May 27
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Apr 11
Silver King M Co	Arizona	J Nash	315 California st	25	May 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	May 12

The Mining Share Market.

Our mining share tables show the fluctnation of the market for the past week, and show that they have not been very marked. The mining dividends paid in May include the following: Bulwer Con. mining company, 10 cents per share, $10,000; Contention Con. mining company, 25 cents per share, $62,500; Deadwood-Terra mining company, 15 cents per share, $30,000; Enreka Con. mining company, 50 cents per share, $25,000; Father de Smet mining company, 20 cents per share, $20,000; Homestake mining company, 40 cents per share, $40,000; Idaho mining company, $7.50 per share, $23,250; Indian Queen mining company, 5 cents per share, $6,250; Napa Con. Quicksilver mining company, 10 cents per share, $10,000; Ontario mining company, 50 cents per share, $75,000; San Francisco Copper mining company, 5 cents per share, $2,500; Silver King mining company, 25 cents per share, $25,000; Standard Con. mining company, 75 cents per share, $75,000.

On and after Monday next the San Francisco Stock and Exchange Board will hold only one session in the afternoon, beginning at 2:30 o'clock, at which the fnll list of ontside stocks will be called and afterwards the Comstocks.

In the north end mines there have been no changes of importance. The Union Con. ore stopes are looking and yielding as usual. The yield of ore for the week will be between 500 and 600 tons. No work has yet been done below the sill-floor of the lower stopes.

After rnnning the northeast drift on the 2600 level out to a point near the Sierra Nevada line (no survey has yet been made) it was discontinued, and a north drift is now being pushed forward from No. 1 winze. Cross-cuts will he rnn east from this to connect with the northeast drift, and to explore and ventilate the intervening ground. Between the two drifts lies the eight-foot streak of ore cnt near the winze some three or fonr weeks ago. The face of the north drift is in very favorable grornd, with streaks of very good ore rnnning through it.

At the 2900 station of the joint Union Con. and Sierra Nevada east winze, the diamond drill was sent out to the west and south. No water to interfere with drifting was found. The ground in both directions is very soft—so soft that it was washed considerahly hy the water sent through the stem of the drill. A drift will he started west and another south next week. This grornd is very promising, hut will require close timbering.

All is going on ahont as neual at the old honanza mines. At the C. & C, shaft they yesterday stopped the pump to pack some plnnger poles, running the tanks for a few houre meanwhile.

At the middle mines the Savage folks are making some explorations on their 2200 and 2400 levels, and some prospecting is heing done on the 2500 of the Hale & Norcross. Not much will he done in the Chollar and Potosi nntil after the Chollar-Noroross-Savage shaft has reached the 2600 level and a west drift has drawn off the water.

Phosphorescence of Minerals.

Many minerals, after heing heated, exposed to light, ruhhed, or electrified, seem to glow or shine in a pecnliar manner if taken into a dark place. This property is called phosphorescence. Thns, if a piece of finor-spar, especially of the massive qnality called chlorophane, he placed on a fire shovel and heated over a spirit lamp, it will, when taken into a dark place, he seen to shine with a hright green light. If an electric shock be passed through a piece of chlorophane, a similar phosphorescence will be produced. It has long heen observed of diamonds that, if taken into a dark room after exposure to the light of the sun, they will shine.

Minerals which become phosphorescent from heat are sometimes called pyro-phosphoric, from friction, frictio-phosphoric, from electricity, electro-phosphoric, and from exposure to the light of the snn, helio-phosphoric. These latter are said to he insolarized, as is the case with some varieties of calcite.

Sometimes a pyro-phosphoric snhstance, hy repeated heating, loses its property of acquiring phosphorescence. This may he occasionally restored hy passing a few electric shocks through the snhstance.

Among pyro-phosphoric minerals, some, as certain varieties of fluor and diamond, hegin to shine in the dark at a temperatnre helow that of hoiling water. A good many minerals shine at a temperature mnch helow a red heat.

Among minerals which hecome phosphorescent hy friction may he mentioned a certain kind of hlende, mentioned hy Collins as from Kapnick, which shines when scratched or ruhbed. Two pieces of quartz will shine if ruhhed together in tho dark, either in the air or under water, and some varieties of dolomite and oalcite emit light when struck hy a hammer.

In grinding eilicious minerals so as to make their sections for microscopic purposes, phosphorescent light is very frequently prodnced.

REPRESENTATIVES of the Miners' Unions at Moore's Flat, North Bloomfield and French Corral have visited the Blue Tent hydranlic mine and asked the management its intentions as to longer employing Chinese lahor. They were told that the force of Mongolians had recently heen redoced to 20, and there were 30 white men on the pay-roll. Also, that the rest of the Chinamen wonld he discharged as soon as the company can raise the money due them for work done hefore the mine had reached the prodncing point. It is not helieved that any trouhle will ensne, althongh some of the Union men are hitter. The Blue Tent, heing a limited oompany, oannot levy assessments to defray expenses, hnt has to rely on the retnrns from the mine, which the snperintendent asserts have not heen snfficient for some time past to pay all the running expenses.

THE grand total in value of preoious metals received hy the hanks in Salt Lake dnring the week ending May 26th amounted to $98,400 52. This does not inclnde shipments of hullion from the Ontario, which sends out eaoh week fine hullion to the value of about $50,000.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

ORION.—Mouitor *Argus*, May 23: Mr. Peter Curtz, Supt. of the Orion G. & S. M. Co., composed of Stockton capitalists, has just completed a boarding-house at the mine for the employees, and is putting things in shape for the erection of hoisting works. The property joins the Stella on the west. The Alpine Hydraulic M. Co. are nearing on to completion their new water ditch, only about 100 rods to be made, and the ditch will be completed to their claim. On last Saturday the company turned about 80 miners inches of water into their ditch, which came down proving that the ditch carries water successfully. We expect within a short time to hear of this company making a big clean-up of "the rock of all evil."

STELLA MINE.—Superior Judge Arnot, Justice Thornburg and County Clerk Harvey visited the Stella mine on Thursday last, and have given us a glowing account of what they saw in the mine. The recent discovery of the new ore body, at a point west of the tunnel and about 60 ft above the tunnel floor has created a sensation among mining men. The former owners of this mine seemed to have failed, simply because their efforts were directed in the wrong direction, they seeking the ore body east of the tunnel—Comstock fashion—while it has now been demonstrated that the ore body is west of the tunnel, though beyond a doubt ore may yet be found east, by sinking to a greater depth than yet done. But about the new find. The chamber disclosing the new body of ore is 16 ft from north to south, 13 ft from east to west and 13 ft high. The roof, face and ends of this chamber are in beautiful ore of great richness, its assay value ranging as high as $500 per ton in glod, silver and copper, about 80 per cent. of this being silver. The scene in this chamber, lit up by the candles in excited hands, is beautiful beyond description, and we only regret our space will not permit of a more extended description at this time. Two miners only were engaged in breaking down the ore, who are able to keep the mill running at its present capacity. From 40 to 60 tons of rich ore were piled on the assorting floor at the tunnel's mouth. The above-named gentlemen tell us that they have never before seen such a wonderful display of rich ore as is now exposed in this mine, and all they say is supported by the fact that more and finer bullion is now being shipped weekly to the company's banks at San Francisco.

AMADOR.

JACKSON.—*Ledger*, May 27: This quartz claim is situated within the town site of Jackson, is owned by Ginocchio Brothers, and is more generally known as the Kearsing mine. This week it was bonded for a period of one year from June 1st, to Grove Adams, M. H. Peck and E. W. Roberts, of San Francisco, for the sum of $7,500. The parties will commence work right away, by means of a patent whim for hoisting purposes. Taking out ore for crushing will be in order just as soon as the tunnels can be got at. The prospects are good for the development of a good mine.

NEVADA.—This quartz claim is located near the Bunker Hill mill on the south side of Rancharia creek, and is owned by Hayward & Hobart. Under the superintendency of Humphry Reese, work was commenced last Monday. A ledge 5 ft in thickness crops out on the surface. A shaft is to be sunk on this ledge, to what depth will of course depend upon the result of the prospecting operations. Nothing is definitely known touching the paying quality of the rock.

MISCELLANEOUS.—Alvinza Hayward has been in the county recently, and gave it as his candid opinion, based on a good deal of mining experience, that Amador is as good a field for prospecting as any place he knew of. Coming from a capitalist like Mr. Hayward, this expression of opinion is deserving of special attention. He has invested extensively in mining in various localities, and comes to the conclusion that Amador, the county that gave him the first start in the road to wealth, stands today the peer of any mining region as an available field for investment. As good results have been achieved in this county, considering the amount of capital invested, as any county in the State. Acting on this judgment, Mr. Hayward is branching out into prospecting operations on an extensive scale.

FROM DRIFTOWN.—Amador *Dispatch*, May 27: The Potosi M. Co. have taken out their pumps and ceased working the property for an indefinite length of time. The Seaton and Maryland Co.'s are still prospecting. The Grover Co. are slowly gaining on the water but will not clear the mine of water before July.

BUTTE.

GOLD MINING CLAIM.—Oroville *Mercury*, May 27: The Cole claim on Big Butte creek is now working 16 to 17 men with excellent prospects. They are now breasting out in a tunnel 2,400 ft in the hill, and have raised an air shaft 300 ft to the surface for ventilation. The mine is owned by Messrs. Starr, Hnbm & Pershaker Mr. Hubm is superintendent, and W. Powers foreman.

CALAVERAS.

CHICAGO & ROCK ISLAND MINE.—Calaveras *Chronicle*, May 27: This mine is owned by a Chicago company, and about 2 months since Mr. August Hoefer, one of the company, and a Mr. Yondorf, passed through here on their way to the mine, which is located near Railroad flat, to prospect the mine to that extent to justify the company, in the event of satisfactory developments, to invest capital in the erection of suitable machinery to work the mine. This has been done, and with results far exceeding expectation. The parties above named, passed through this place one day this week on their return to Chicago to make their report and perfect arrangements for the future management of the mine. Between 50 and 60 tons of rock were taken from the mine, 40 tons of which were milled and the remainder subjected to the arastra process. By the mills the rock yielded $35 per ton, and by arastra $48 per ton. It is a settled thing that the company will erect hoisting works, construct a mill and proceed to work the mine. We are informed that W. V. Clark, of Railroad flat, has taken the contract to supply the necessary lumber for building purposes, and that the parties expect to return in the course of 5 or 6 weeks, when the work will be started and pushed to completion.

EL DORADO.

PLEASANT VALLEY MINE.—*Mountain Democrat*: The new 10-stamp mill recently erected by Dan Wickham, at the Pleasant Valley mine will be started up next Monday. Experienced miners and competent judges pronounce it the most perfect 10-stamp mill they ever saw; the most commodious, complete in all of its appliances, and the most convenient in all its arrangements. The building is large enough to accommodate 10 more stamps, and the power is sufficient to run them. They are prepared to run the mill either by steam or water-power. For the latter they have a 44 ft Knight wheel and a water pressure of 108 ft. The mine is in fine condition. Nineteen hands are kept busy taking out ore from all parts of the mine, much of which is of extra fine quality. There are about 2,000 tons on the dump, and it is the intention to crush at least 600 tons a month henceforward.

THE SAILOR JACK MINE.—At this mine, in which Bogust, Gray and Houx recently made a rich strike, a shaft has been sunk 25 ft and a drift started on the ledge. On Wednesday of last week—the 17th instant—they took out of 100 pounds of rock, crushed with a hand mortar and pestle, about $300. From the ore extracted from their shaft and drift they have pounded out upwards of $3,000, and the dump is full of ore in which there is a fine showing of free gold visible. The boys are jubilant.

A LIVELY MINING CAMP.—The season is opening with manifestations of extraordinary activity at Grizzly flat. Everybody is busy and the prospects are brilliant. Ben. Bullard commenced operations a week ago last Monday at the Sacramento mine and mill, and is taking out a large amount of good milling ore. The Melton brothers have commenced operations in their mine and have started up their mill, with highly satisfactory results. At the old and reliable Treat mine, Frank Teagne and partners have taken a contract to sink the shaft 25 ft deeper, then to drift to the ledge, and then to drift along the ledge a distance of 60 ft. A horse power whim is being put up on this claim. An Eastern company, for whom Ben. Parlow of this city, is superintendent, are working a northern extension of the Driesbach claim, putting up a whim and sinking 2 shafts. J. E. Lyon is doing a large amount of work on the Driesbach claim. He has put up a whim on the new shaft, which has been sunk 100 ft within the past month, having passed through the old ground, and being now in fine ore. The tunnel has been completed and well timbered through 450 ft of old ground and 50 ft of new ground, making 500 ft in all. S. P. Hoskins has purchased the opposition sawmill from Olmstead & Co., and is now fitting up both in anticipation of a lively season.

INYO.

MINING SALE. *Independent*, May 27: According to a deed placed upon the county records last Thursday, Theodore Wibbelt, of this county, has sold to Edward Reilly, the noted copper mining capitalist of New York, the following mines, situated in Sherman mining district, which is about 25 miles northeast of Darwin: The Bonanza King, North Star, South Point, Natolia and Star mines. Also, several water rights and some land adjacent. The consideration named is $12,000 cash, which from reports we have heard from the mines is next to getting them for nothing. These properties were examined by Mr. Reilly's expert, Wm. R. Chadsey, and were sold to John H. Ely, who had theu under bond. We believe that Reub. Spear went to Los Angeles to receive the money.

DARWIN NOTES.—Messrs. Reddy & Gorman are getting in supplies preparatory to making another successful run of furnaces which they intend to commence in the early part of June. Frank Fitzgerald, "the hero of Modock," started the furnace yesterday, having 500 tons of excellent ore at the furnace and a good supply of coal, etc., and more coming in. J. C. Eddy, who is operating at Snow's canyon, evidently means business, from the fact of his having 20 men employed at that camp, besides a pack train and 2 teams packing ore and hauling wood, etc. Supt. Pheby is making things lively at Panamint just now, running the 20-stamp mill on high-grade ore from the famous Wyoming and Hemlock mines. He also has a fine lot of high-grade ore from the Ida mine, which is said to excel all the mines in Panamint for quantity and quality of rich ore, Judge Russell's mine excepted.

MONO.

NOTES.—Homer *Mining Index*, May 10: Work is being pushed in the Gorilla mine with an increased force of men. Prospectors are still branching out into the mountains, notwithstanding the recent cold snap. Work is being actively prosecuted in the tunnel of the Grizzly mine, and the vein is working well. Some very rich free gold rock is being taken from the lower cut in the Garfield mine on Mount Oilcrest. Some fair assays in silver have been obtained from a 6-ft vein to the west of Lake Ada, near the head of Lake Canyon. The May Lundy tramway is being repaired, and the indications are that that mine will shortly be started up with a large force. Work is being steadily prosecuted in the shaft of the Josephine claim near the head of Mill Creek canyon, and the vein is improving in appearance as depth is attained.

NEVADA.

THE CHICAGO QUARTZ MINE.—A company has recently been incorporated to work this mine, which is located on Gold flat, about a quarter of a mile east of the Pittsburg and about the same distance south of the Gold Flat, Eureka. By some it is thought to be the same ledge as the Eureka, or a continuation of it. The mine was first worked some 16 or 18 years ago, but it is now about 6 years since any rock was taken out of the ledge. There is an old tunnel 800 ft long and this, after being driven 70 ft further, will be used to drain the incline, which is down 300 ft. When the tunnel is completed hoisting works will be erected and the shaft sunk to the level of the old works. It is expected that everything will be ready to put up machinery in the course of 30 days.

IMPERIAL MINE CLEAN-UP.—*Tidings*, May 29: The Imperial crushing, of 3 loads of rock taken from the ledge as it was cut through at a depth of 80 ft, yielded $16 75 per load of free gold, and 400 pounds of sulphurets which have not yet been worked. The ledge is a solid 5-footer, and rock takea from it is about the average.

THE POCKET CLAIM. Grass Valley *Union*, May 28: The pocket ledge lately found by Mr. H. B. Nichols on his ranch, a short distance from town, still holds out nicely. The stringers from which the rich rock is taken were found while ground-sluicing, and they are several in number, all pitching toward each other, so that it is quite probable that at a depth of 100 ft or less they will come together and form a ledge. From the first pocket about $500 was taken; the second pocket about $140; and now work is being done on another pocket found a few days ago. The last find seems to be more extensive than any of the others. Mr. Nichols has leased the ground, or rather tributers are working it for 50 per cent. of the proceeds. A shaft is now being sunk on the claim, which will be put down as rapidly as the men can sink it, and it is very probable that at no great depth the ledge will get larger and better defined.

MOUNT DIABLO.—*True Fissure*, May 27: Winze No. 1 has been sunk 15 ft during the past week and shows low grade quartz in the bottom. Winzes Nos. 3 and 4, from the third level, have been connected by a drift from which crosscutting has been commenced. The east drift on the second level has advanced 14 ft. An upraise is now being made to the north and east of the shaft, and is now in ore which assays from $37 to $45 per ton. The showing at this point is very favorable. The south crosscut from the east drift on the first level is in 132 ft and shows small streaks and spots of ore that give good assays.

NORTHERN BELLE.—The main drift from the fifth shaft level has been extended 26 ft during the week, the face of the drift being 163 ft distant from the station. It is now showing a large formation. About 66 tons of ore are being extracted daily and sent to the mill, which is running steadily and doing its usual good work. Shipments of bullion amounted to $27,409.73 for the week ending May 25th; and aggregate $33,705 30 on May account to the same date.

PLUMAS.

SPRING HILL.—Plumas *National*, May 27: There is some reason to think that this magnificent body of gravel, which is located some 3 miles south of Meadow valley, will attract the attention of capital this year, and that the work of developing it will commence in good earnest. No work has ever been done, as yet, which begins to show what is concealed in the walls of the channel, but enough indications are in sight to prove it good, and some day a rich harvest will be reaped by the company owning it. Bone & Co., the owners of the Spring Hill mine, have put in a tunnel some distance, and the bank of gravel which it develops is equal to any we have ever seen. The wash is beautiful, smooth, solid and blue, and carrying good prospects in gold. The ravines which have broken from this immense ledge have been notable for their richness, and why the channel has escaped the eye of mining men who have the means to open it is a mystery. If it had been situated in Sierra or Nevada county it would have been riddled with tunnels years ago; but there it is, with no sign of a prospector's work, except the short tunnel spoken of, run by men who have little or no capital, and only their muscle to depend on. When that ridge is thoroughly prospected and opened, as it should be, there will be work for 1,000 miners, and a season of prosperity for the district which will remind the old Californian of the days of '49.

A BIG MINE.—The Plumas Mining & Water Co. now has its pipes in full blast in the Metcalf and Haycock claims at Gopher Hill, and are sending down the sluicings in a lively manner. The main bank is about 180 ft high, with from 15 to 20 ft of gravel on the bedrock. Against this two monitors, one throwing an 8-inch stream, are directed, and the dirt and gravel fairly melts away from them. A large body of pipe-clay is found above the gravel, and it has to be blasted, employing some 7 or 8 men. About 30 men are on the pay roll of the company. We learn that the mine is paying well, and averages about $400 per day. They have a full head of water at present, and the supply will probably hold good for some time yet, as the cool weather is favorable.

CRESCENT HILL.—Frank Vere & Co., the owners of Crescent Hill, near Claremont hill, and on Bachelder creek, have again commenced operations on their tunnel, and will push it through as rapidly as possible. The tunnel is in a short distance—about 75 ft—and they only have about 150 ft to run to strike the gravel. They have a very extensive claim, and are certainly on the blue lead. The boys are hard-working men, and we hope they will be richly rewarded for their outlay. The tunnel has already tapped a fine stream of water from the channel, and the indications are first-rate for a good paying mine.

SIERRA.

RICH QUARTZ.—*Sierra Tribune*, May 25: "Doc." Stewart showed a reporter of the *Tribune* some very rich quartz at the county seat last week. The rock was taken from a ledge on Kanacka creek which Mr. Stewart and another Downieville gentleman recently located. It was literally alive with gold, and would probably assay way up in the thousands et dollars.

THE BALD MOUNTAIN EXTENSION MINE.—The Bald Mountain Extension Co. is driving its tunnel through bed-rock north 30° east. On raising up 61 ft fine-looking washed gravel was encountered. It is expected to strike the pay channel at a distance of 200 ft further ahead. This mine gives promise of becoming one of the richest and most extensive gravel mines on the coast, and the plucky owners are deserving the success which they are almost certain of meeting with.

A BIG FORCE.—The American Hydraulic M. Co. at Merristown is working 35 men, and 40 more will be added to the force very soon. This is very encouraging for that section.

A NICE PROSPECT.—Frank Hauber was over from Alleghany last Sunday, and informed us that he had made a big strike in the ledge on Kanacka creek that he is developing. He commenced work on the ledge some 15 years ago, and has been prospecting it at intervals ever since. The tunnel which he is engaged in running at present is in a distance of 50 ft. The ledge at this point is about 2 ft in width, is composed of fine-looking ribbon quartz, and shows free gold quite plentifully. The owner will at once proceed to extract a quantity of ore and have it milled, which, judging by its appearance, will yield sufficient returns to permit of his operating on an extensive scale. The tunnel furnishes 300 ft of stoping ground, and tunnels can be run to give a still greater depth on the ledge. This is only one of the many private enterprises that are being carried on in a quiet way in this county, and we are always glad to chronicle the success of such. It is evident that the attention of prospectors is being drawn very rapidly towards the quartz interests of the county, and the rich deposits that are being revealed daily go to infuse interest in that class of mining, and illustrates that steps are being taken in the right direction.

TUOLUMNE.

ACTIVE WORK.—Tuolumne *Independent*, May 27: The Montezuma tunnel, in Table mountain, is being repaired for active work. Mr. McNamara, of Candelaria, Nev., who is a thorough miner, proposes to work the old channel, and is satisfied, from the large amount of gravel and the excellent prospects, that the diggings will pay handsomely. On the 18th inst. they took out a quartz bowlder not weighing much over 50 lbs, and, on breaking it up, pounded out at least $40. The stone was round, well-washed gravel. Under this bowlder, in the smaller gravel, was panned out $10 more in coarse, washed gold. Another channel, several hundred ft further in the mountain, which was tapped by miners several years ago, just prior to a heavy cave, prospected largely, and for this point they are now clearing way. T. J. Evans last summer discovered a rich vein of quartz about a mile from his residence in the mountains, and sunk a shaft, from which he took out considerable gold. He purchased a large engine and boiler from the Eames' mine and placed it near the shaft, when the heavy snows and rain set in, caving the shaft and precipitating the machinery. Notwithstanding this misfortune, Mr. Evans, with his characteristic energy, went to work this spring, now has the mine in good working order, and we are pleased to say he has struck the gold in larger quantities than ever. Con. Kearney, in his gravel claim at Brown's Flat, is taking out rich gravel. Several rich strikes in quartz are reported the past week. Some of them need confirmation.

TRINITY.

NEW MINING COMPANY.—Trinity *Journal*, May 27: Parties residing in Weaverville, Lewiston and French Gulch have advanced $3,000 as working capital and taken stock therefor in the Brunswick Mining & Milling Co., the preliminary steps for incorporating which have already been taken. The property of the new corporation consists of two quartz mines, water right, etc., in French Gulch district, near the summit of Trinity mountain. A shaft of 65 ft on the New Brunswick shows a ledge 3½ ft in which will go $30 to $40 per ton on the average. The capital stock of the company has been put at $100,000, divided into 20,000 shares.

NEVADA.

WASHOE DISTRICT.

OPHIR.—*Enterprise*, May 28: On the 2900 level are timbering up the main south lateral drift and cutting a drain in the same.

COMBINATION SHAFT.—During the past week the Chollar-Norcross-Savage shaft has been sunk 27 ft, making the total depth 2,548 ft.

CON. VIRGINIA.—The south drift on the 2700 level has been extended 6 ft. Joint California east drift No. 2 has been advanced 17 ft.

MEXICAN.—On the 2700 level west crosscut No. 2 has been advanced 27 ft, and winze No. 1 has been started.

UTAH.—On the 2500 level the main south drift has been extended 20 ft. Have finished repairing and retimbering the incline near the 1350 level.

CALIFORNIA.—The main south lateral drift on the 2700 level has been extended 6 ft. Joint Con. Virginia east drift No. 2 has been extended 17 ft. The west drift, 2700 level, has been extended 26 ft.

SIERRA NEVADA.—No. 2 winze on the 2500 level has been sunk and timbered 10 ft. On the 2700 level main north lateral drift No. 1 has been extended 29 ft, and north drift No. 3 has been extended 40 ft.

ALTA.—During the past week the west drift was extended 38 ft; total length, 1,368 ft. We completed the bulkhead in the main east drift at noon to-day, and the water is now shut off. The water in the incline has been gradually rising the past 15 days. It stands to-day 15 ft above the 1750 station.

UNION CON.—On the 2500 level are stoping out ore. On the 2000 level the north drift has been extended 41 ft. On the 2700 level south drift No. 2 has been advanced 40 ft. On the 2800 level the upraise has been extended 37 ft. During the week 561 tons and 1,200 lbs. of ore have been extracted from the 2500 stopes, and 426 tons and 790 lbs. have been sent to the mill. Amount of bullion in office, $12,511.76.

YELLOW JACKET.—On the 1028 level we have got in some 400 ft north of the shaft. We find the old drifts and stopes in fair condition, but the air very warm and bad, owing to the closing of air connections in the north part of the mine.

BATTLE MOUNTAIN DISTRICT.

SOME PROMISING CLAIMS.—Lander *Free Press*, May 27: Messrs. Kinney & Bradshaw have a number of very promising claims in Old Battle Mountain district, which they are now engaged in working. Among the number may be named the Silver Thread, St. Charles, Lost Boy, North America and Pacific. These 5 claims are in close proximity to the famous Little Giant mine, which turned out somewhere in the neighborhood of $500,000 in bullion a few years ago. The owners have out at the present time over 200 tons of excellent ore, which is sacked and ready for shipment, but they have concluded not to ship, and are now making arrangements to put up a furnace in which to reduce it. Over 400 ft of tunnels and drifts have been run, and the ledges are improving all the time. Several years ago this camp was quite lively and a good-sized town sprung up, but the Little Giant "petered" and the mill was moved away. There are undoubtedly a number of good mines in the district, and they are sure to come to the front shortly. We understand that Messrs. Bradshaw & Kinney could have had $30,000 for their mines a couple of weeks ago but wanted several thousand more. If these gentlemen succeed in their efforts to erect a furnace, Old Battle Mountain will have a boom in less than 6 months.

ESMERALDA DISTRICT.

BULLION SHIPMENT.—*Herald*, May 25: The Humboldt Hill M. Co. this week shipped a small bar of bullion weighing 151½ ounces. The mill will make a clean-up on the 4th or 5th prox. Gov. Blasdel reports the mill working splendidly and all work moving along satisfactorily.

PARADISE DISTRICT.

MILL.—*Silver State*, May 27: A small 4-stamp mill for the Credit Mobilier mine, in Paradise district, owned by A. M. Sadorus, has arrived at Golconda, and will be taken at once to the mine. Paradise district is situated about 12 miles from Golconda, in the range of mountains between the Humboldt river and Paradise valley; and the Credit Mobilier mine, the first found in the district, has produced considerable rich gold-bearing quartz.

SAFFORD DISTRICT.

THE CLAIMS.—Cor. Eureka *Sentinel*, May 27: On the Contention the shaft has been sunk about 12 ft, all in rich vein matter. The air being bad at the bottom, air pipes are being made here to improve the ventilation. Jonathan Walker, in digging a cellar on the side of the mountain back of his house for the purpose of storing his goods, struck the ledge on his claim at a distance of 15 ft from the surface.....Work has been resumed on the Key West. This claim was located last year, and is one of the most promising claims in the district. They have a shaft down 50 ft, with ledge of 20 inches of carbonate of lead ore assaying $175, and have about 10 tons on the dump.....The Lucky Jim claim was located last year, and is 1½ miles south of the Onondaga. It is the property of Jim Mattock and others, and will be worked this season for all it is worth.....The Delaware is located northwest of the Mohawk and directly on the great ore belt. It is convenient to the river, and, with small expense, could be made a paying property. It belongs to Messrs. Fletcher, McLellan, Canavan & Cheney.....The Neb Hill claim is on the south side of the canyon, and belongs to Jack Patch, the founder of the town of Safford. During the winter a tunnel was driven into the mountain 75 ft, cutting several seams of rich ore. Unfortunately, the labor thus expended is of little use, except to demonstrate the fact that the great lode crosses the canyon. The C. & C., the property of Molinelli, Smith & Co., lies to the east and north of the Onondaga. A shaft is being sunk on it. There is a ledge 12 inches wide in it, carrying ore of low grade.....The road to the mines has been reconstructed, and the approach to the mines is all that can be desired.

MONTANA.

MARYSVILLE.—Cor. Helena *Independent*, May 24: The Belmont mine and mill are running in full blast, having secured a needed supply of fuel and mining timbers..... The Pony mill at Bald Butte is doing excellent work, and has a dump of thousands of tons of rich ore to work on.... The Closter mine and mills are perfect beehives of industry, turning out the yellow dust by the shovelful.... Mr. N. S. Vestel, the man to whom this section is indebted for its start in a prosperous life, has recently returned from the East, and already the power of an energetic, rustling man of tried experience is being felt. Messrs. Vestel and Muth are having a test of some 20 tons of ore made from the Empire lode, which is now going through the Cruse mill....Your correspondent fondly hopes to soon chronicle the fact that a mill will be erected on the Empire the present season....I learn that the Drum Lummon mine and mill will run steadily from this on.... Mr. Cruse has struck a body of very fine ore on the North Star, about 1,500 ft east from his tunnel on the Drum Lummon. Truly, Cruse hill appears, as developments go on, to be a vast mountain of treasure....Warren De Camp has been taking out some fine rock from the Wine Cour the past winter, and will crush it in Vestel's arastra.

THE MOULTON.—*Inter-Mountain*, May 22: From Supt. J. K. Clark, of the Moulton, it is learned this morning that the mine and mill are in satisfactory operation. Two weeks ago a shaft 500 ft west of the main workings was started, and will be sunk as rapidly as possible to a connection with the lower levels for ventilating purposes. In the bottom it shows a well-defined vein of ore 2½ ft wide, which samples from 65 to 600 ounces, and averages 100 ounces. In the mine the various workings are looking as well as usual, and the productiveness of the property is slowly but surely increasing. During the past month the mill has been constantly running, with the exception of one day, during which time it has treated 40 tons every 24 hours. Despite this heavy and regular consumption, however, the ore has steadily accumulated, and now fully 500 tons are on hand available for reduction. Mr. Clark states that the condition of the property throughout is very gratifying. The Cornish pump and the other extensive machinery is running smoothly. About 100 men are employed. Battery samples run between $35 and $40, which is high enough to insure good profit.

IDAHO.

VIENNA CAMP.—Wood River *Miner*, May 20: The showing made by mines and prospects about Vienna Camp last season, and the rich strikes made during the past winter have resulted in attracting the attention of a large number of miners, prospectors and business men toward it. Buildings have been going up rapidly during the past few weeks, which are to be occupied as general merchandise stores, hotels, restaurants, saloons, etc. The first stock of provisions, of any amount, to reach Vienna this season, arrived there by pack train last Sunday. Meat, flour, etc., have been as high as 75 cents per pound during the season of snow. From 75 to 100 men are employed in the mines about Vienna at present, but this number will probably be doubled or trebled during the next 60 days, as a number of prospect owners have decided to begin developing their properties immediately upon the disappearance of snow. The 40-stamp mill for the Vienna M. & M. Co. is already en route from Blackfoot for Vienna. The outfit weighs nearly 300,000 lbs, and is being brought in by extra long trains of mules and freight wagons. The mill is expected to be up and dropping stamps some time during the fall. There is already an embargo on the dumps of neighboring mines to keep it pounding away until next season. There are a number of very fine properties already developed, to a considerable extent, in the vicinage of Vienna, for many of which applications for patents have been applied for. The builders of the new town have big hopes for the future of Vienna Camp.

THE ROADS, ETC.—*Wood River Miner*, May 24: The roads up the various gulches, canyons and valleys have opened up pretty well during the past week. Light teams can now get into Calena and all the canyons below. The grade across the range is still closed to teams. To the west the road to the Smokies is scarcely open yet, but will doubtless be in a few days. The stages generally come in on time, from all directions....Many mining men who went out to spend the winter in milder climes have returned, but many are still out, scattered throughout the United States, or in Europe....Mining men who are not actually interested in our mines, but are willing to be, if they can get hold of property at reasonable figures, are arriving daily, but they hardly seem to be looking for mines yet, as they evidently prefer prospects, and at prospect figures. An exception to the above is Mr. Farwell, of Chicago, and his party, who came in last Sunday, and seem willing to pay liberally, though not extravagantly, for any claim they wish to buy. They are said to be figuring on the Bullion, Ophir, Eureka, Wolf Tone, and other claims, with the intention of erecting a smelter if they conclude to invest....At and around Bellevue some life has been instilled by the arrival of E. A. Martin, of the smelter, who says that he has bought out Jos. H. Douglass, and proposes to run it alone this summer. Mr. Martin will doubtless make a success of his enterprise. The Minnie Moore people are awaiting the result of their trial shipment to San Francisco. Other claims are being worked as usual.

OREGON.

CHICKEN CREEK.—Bismarck *Democrat*, May 24: From a gentleman from the above place, we learn that the mining season has opened with plenty of water, and the miners are jubilant at the prospect of a remunerative season. Some of the best prospects ever obtained in the county have been found on Chicken creek this spring. Weatherby & Osbourn, are working two claims; Colman Campbell & Co. are working one claim; the Cooper Bros. are utilizing every moment; Dundrover & Croaker are busy, and Roland Parker improves each shining hour. A company of Chinamen are also at work on the creek.

ARIZONA.

WINCHESTER DISTRICT.—Tombstone *Epitaph*, May 23: Winchester district is about 12 miles from Willcox and not more than 9 miles from the railroad. There are about 130 claims recorded in the district, and more than half of them are being actively worked. The principal mines of the district are the Winchester Con., which comprises the Grand View, Antelope, Dexter and Great Western, the Parnell, Longfellow and Philadelphia, which has 7½ ft of good pay ore a short distance below the surface. A shaft has been sunk on the Winchester Con. at the junction of the Grand View and Antelope, and at a depth of 70 ft has been crosscut, striking at a short distance a vein of ore 2½ ft wide, that rapidly expands as the work of development is prosecuted.

GLOBE DISTRICT NEWS.—*Silver Belt*, May 24: The Centennial Co. are reported as intending to start their mill this morning, having a quantity of good ore on hand. A fair return is expected. The Monarch, a valuable copper property, belonging to T. C. Stallo and D. H. Smyth, is situated 6 miles from the mouth of Mineral creek, having a well-defined vein and 18-inch gouge on hanging wall. The shaft is already 80 ft deep. In the irene, from the tunnel level, the winze is down 90 ft, showing an improvement in quality of ore, and work still progressing under contract of $15 per ft. The Old Dominion furnace is in blast. Eleven thousand pounds of copper were shipped Thursday. More coke for smelting purposes arrived yesterday. The Old Globe Copper mine is being vigorously worked, and from present developments is regarded as second to none in the district. The Hoosier copper company are showing large quantities of ore. The Buffalo company are hauling ore to the furnace. Arizona, and particularly Gila county, is not half prospected. The prospector to-day is as liable to find paying ledges as when the pick first entered a vein. Some spots have, it is supposed, been thoroughly examined, but they are few in comparison with the mineral-bearing territory within the boundaries of the county.

THE COPPER BELL MINES are located about 2 miles north of the Gila river and about 20 miles above Florence. There are 15 locations, all showing large bodies of first-class copper ore. The Copper Bell group is in a complete basin and consists of 4 parallel claims located across the ledge, which is from 400 to 600 ft wide. Tests made by competent assayers show the ore to be fully equal to the best mines that have yet been discovered on this coast. The ledge does not crop above the surface, but is a flat body, all good ore the length and width of the ledge. The millsites are located on the river 2 miles from the mines, and there is a gradual slope from the mines to the river, and a good road can be built at a trifling cost. The road from where the smelters will be erected to Florence will run along the bank of the river, giving a natural wagon way, with not a hill to go up between the two places.

NEW MEXICO.

NOTES.—*New Southwest*, May 20: The Black Hawk mine, at Ballard's Peak, is producing some very rich ore. .....Messrs. Higby & Crawford will soon begin work on their mines in Ballard's Peak district.....Thirty-five thousand dollars was paid yesterday through the bank of Porter & Crawford for mining property in southern New Mexico.....The Silver City Co.'s mill started up on Tuesday morning on Sherman ore, and has been running steadily ever since. There are over 100 tons of Lone Mountain ore in the bins awaiting treatment.....Work on the Sherman mine progresses satisfactorily. The 100 level has changed somewhat, and is much more mineralized, particularly in the south drift. Low assays have been made during the week from this drift. The stopes above the tunnel level have been producing about 8 tons of good ore per day, and are looking well at present. The shaft house is now completed. The Silver City Co.'s mill is now crushing 100 tons of ore as an experiment. The result will be known in a few days.

GRANT CO. COAL BEDS.—About one year ago Louis Anderson and Wm. H. Fickles discovered coal in the Little Burros, about 9 miles southwest from Silver City. The lowest outcropping vein at the bottom of a large gulch is about 20 inches. There is another vein 6 ft above the first, about 12 inches in width, and a third outcropping about one mile from the first discovery is about 8 inches wide. A coal basin with outcroppings of horizontal layers of sandstone can be seen for about 8 miles southwest by northwest, and two miles wide, when it disappears under the mesa. The discoverers have located one section of this coal land.

UTAH.

COPPER.—Utah *Times*, May 7: The O. K. copper mine in Beaver Lake district is still working. There are two shafts down to the depth of 75 ft, 20 ft apart and are connected by a drift at the bottom; thence a drift is run 80 ft across the ledge to strike the hanging wall which, we believe, was never struck. They then started to sink the old shaft, which was about 16 ft deep, and now have it down over 100 ft. Some very rich carbonate ore has been found, which looks very favorable for a silver-lead mine.

NOTES.—The old Hickory mine in North Star is still working, it having been leased by A. F. Thomas, who is taking out some good ore.....The South Horn is down 200 ft. It is looking very favorable in the bottom, and it is expected that a few feet more will strike ore.....The St. Marys is working with very gratifying success. This mine has a fine showing of ore—the biggest to be seen in the county.....Work on the 400 level continues without much change, except that the formation is softer than usual, which is certainly very encouraging.....The Cactus is down over 50 ft. The ore still continues as usual. The water increases a little but so slow as not to interfere with the workings of the mine.....A contract has been let to sink a shaft on the Comet mine. The tunnel will continue to be run just the same until the hanging wall is struck. The ore contioues the same as usual.....The contract let by Messrs. Ferrell & Sparks was finished during the week. The mine is much improved, and it is to be hoped the owners will not let it remain idle long..... The Mammoth tunnel is progressing, and is very near the ledge.....There is quite an excitement over the discovery of a 20-ft ledge about 5 miles north of Copper Ouich, near the Young America mine. The lucky owners are working away for all there is in it, and if the reports from there are true, we may soon expect to see a new bonanza opened up. We wish the boys success.

THE Commissioner of the Land Office has refused to deliver certain land patents, having ordered an investigation into alleged frauds in the entries on which they are based.

The Unsuccessful Prospector.

For six long years I've tracked the trail
Behind that faithful burro's tail;
For six long years I've sought to find
A trace of treasure of some kind.
I've climbed almost from pole to pole,
And dug full many a prospect hole.
Alas, my fortune must be bound
In rocks that are not to be found.
How often have I watched yon sun
When a day's search was nearly done,
Tarry above the lofty crest
Of the gray mountain's rocky breast,
And spread it's sheets of brightest gold
In beauty wondrous to behold;
I've watched it till the twilight's gleam
Dispelled the vision like a dream;
Its red gold lingered on my mind
Like incense on a summer wind.
Oh, could I find such brilliant ore,
I'd dig the earth from core to core!
But no. My fate seems buried deep
In failure's dark chaotic heap.
I cannot strike the longed-for lode,
Or find the dark occult abode
Of veins and leads that assay high,
That capital dare risk to buy.
No, burro, we'll give up the chase
And settle in some quiet place;
To copper stains we'll bid farewell,
A last adieu we'll fondly tell
To calcite drops and heavy spar,
To iron caps and red sand bar;
All will be, as a legend old,
Etched upon silver leaves and gold.
This well-worn pick I'll cast aside,
This shovel plant on yonder slide,
A monument to wealth unfound,
Neath porphyrish and quartz ground.
Come, burro, let us hie away
And search but for another day.

—*Socorro Sun.*

Annatto.

We give on this page an engraving of the foliage and seed capsules of ashrub which has a peculiar agricultural interest in this country, in that the interest lies rather in its use than in its growth. It is the plant which yields the yellow coloring matter used for imparting a golden hue to butter and cheese, whenever the dairy man finds that his market value is improved thereby. It is a plant of many names, and may be called annatto, or annotto, or annotta, or arnatto, or arnotto. Or, if none of these suit, it may be called rocou, or orlean, or achiote. The botanist, however, escapes from this maze of synonyms and names it *Bixa orellana*. Botanically, the genus *Bixa* belongs to the order *Flacourteaceæ*—a natural order of exogenous plants, allied to the passion flower, consisting of shrubs and small trees, almost exclusively confined to the warmest parts of the globe. The genus *Bixa* is distinguished by complete flowers with simple stigma, a bispid calyx of five sepals, and a two-valved capsule, as may be seen in the engraving. The shrub annatto is a native of tropical America, but has been introduced in other warm countries, and is now grown for its commercial product in Africa, the East and West Indies and South America, but is chiefly cultivated in Guadaloupe, Cayenne and Martinique, and sparingly in Mexico and Brazil. In the three French colonies named they have about 6,000 acres of land in cultivation, and produce annually about 3,000,000 lbs. of the commercial annatto.

The coloring matter in the plant lies in the pulp which invests the seeds. It is of a reddish color, and the yellow tint in butter and cheese is secured by great dilution—a little excess would give the material a deep red color. The natives in the countries where the shrub is grown, employ various methods to separate the coloring matter from the seeds and reduce it to a merchantable form.

1. The pulp and seeds are treated with hot water, left to macerate in the presence of an anticeptic, and separated by pounding with a wooden pestle; the seeds are strained off, the pulp is left to settle, the water is decanted, and the coloring matter, in a pasty condition, is exposed in shallow vessels to dry gradually in the shade. When sufficiently consistent, it is made into rolls or balls of two to three ounces, and dried in an airy place. 2. The entire ripe fruit is coarsely crushed, treated with hot water, and soaked for several days; the seeds are then strained off, and the pulp is left to ferment for about a week; the water is poured off, and the dye-stuff is dried in the shade till it can be made up in cakes of three to twenty pounds, and covered with banana leaves. This is known as "flag annatto;" it is inferior, owing to the fermentation. The fresh article contains about 5½% of coloring matter and over 70% of water. 3. The Indians adopt a laborious process. They rub the fruit with oiled hands till the pulp is separated and reduced to a clear paste; this is scraped off the bands and laid on leaves to dry in the shade. The product is very superior.

The Indians rub the coloring matter into the skin of their whole bodies, thus intending both to adorn themselves and to obtain protection against the bites of mosquitos. Annatto is used in medicine for coloring plasters, ointments, etc. and in dyeing it was formerly largely employed to impart an orange tint to simple yellows, but it does not impart a permanent color and other materials have been substituted for it. It is also used in some varnishes. In South America, it is very extensively mixed with chocolate, both for color and improving the flavor. The seeds are said to be cordial, febrifugal and astringent. The roots are used in broth and have the properties of the seeds, but in an inferior degree.

The Age of Gold in Chile.

From the time of the Incas the enormous auriferous resources of Chile have been generally recognized, and almost every historian of and traveler in South America has given prominent notice to the region, yet those resources are still but partially developed, and for generations the mass of the inhabitants have been in absolute poverty. This is no doubt attributable in a great measure to the fact of Catholicism being the prevailing religion, for it is observable that wherever that system is practiced, ignorance and misery rule supreme. Industrial prosperity can scarcely exist under it, and it is precisely in those countries where it has least influence that social progress is greatest. Spain has long since sunk into nothingness, and her former South American colonies are in no better position. Ireland has grown worse and worse in proportion as influence has been given to a servile and half-educated priesthood; and Italy, after having been sunk into the greatest depths of crime and misery under similar influence, is recovering in proportion as the control of Catholicism is being broken down. The display of greater tolerance in Chile will have an equally favorable effect on the community, and it may be hoped that industries which have long been neglected may be revived. Chilean gold mining should be among the earliest revivals, for Rosales, in his "History of Chile," has described it as "*una de las provincias mas opulentas de oro que se an descubierto en la America.*" And this is confirmed by the French traveler, Frezier, who, writing in 1716, remarks that it may be said generally that the whole country is very rich, though the inhabitants are very poor in money, because instead of working their mines they content themselves with the business they do in hides, tallow, dried meat, hemp and corn.

FOLIAGE AND FRUIT OF THE ANNATTO PLANT—Bixa orellana.

There now seems to be a disposition to offer greater encouragement to miners, a circumstance which adds much to the interest of Mr. Mackenna's work on the "Age of Gold in Chile." "*La Edad del Oro en Chile o sea una demostracion historica de la maravillosa abundancia de oro que ha existido en el pais, con una reserna de los grandes descubrimientos argentiferos que lo han enriquecido, principalmante en el presente siglo, i algunas recientes escursiones, a las rejiones auriferas de Cataxilco i quedradas de Alvarado i Malcara. Por B. Vicuna Mackenna. Santiago: Cervantes. Valpariasiso: J. Purves, Calle Esmeralda,*" which forms a large volume of about 500 pages. It appears that Mr. Mackenna's object in writing the book has been to call the attention of his countrymen to the necessity of an alteration in the mining laws—assimilating them to those of Australia and of California, in order that the auriferous wealth of the country, which unquestionably exists, may be explored, and produce the same grand results that have followed the gold discoveries in the countries mentioned.

Mr. Mackenna explains that the title of his book is more historical than statistical, more demonstrative than industrial, more elegant than economic and speculative, sufficiently explains his object, while the variation of his one Spanish letter explains the nature of his discourse and his argument. He does not say "*la edad de oro en Chile,*" but "*del oro*"—not the golden age in Chile, but the age of gold. He maintains that the colonial age was certainly not the "*edad de oro*" which the poets have sung about and the historians imagined concerning this distant country. Quite the contrary; that was the age of dejection, of ignorance, of catastrophe, of shame, and of weeping. But at the same time it was undoubtedly the "*edad del oro,*" for, as the conqueror, Pedro de Valdivia, said, the entire country was nothing but "a mine of gold," although every grain of it cost his subjects, by the inclemency of the weather, the war, and the conquest "*cien gotas de sangre i el doble de sudor*"—100 drops of blood and 200 of sweat. Gold was very abundant in these ages of gold; in fact, the soil appeared to be impregnated with the precious metal, and in Mr. Mackenna's opinion it really was so, but, as in the present day, it was disseminated in molecules so small and difficult of amalgamation and recovery that it was only by a total change in the processes, individually and collectively, that great results, especially in the virgin soil of Arancania, could be looked for. But it is indeed not drops of sweat, much less drops of blood, which are required for the working of the gold on a large or on a small scale in these days of liberty and of moral and mechanical progress, but drops of engineering condensed into steam, or hydraulic power, applied to colossal winding machinery, destined to replace the weak and dejected slave of the Encomiendas and the slow and fatiguing mill which grinds the auriferous quartz during the rains only, and at the rate of but three or four ounces of powdery gold per day.

Commencing with an account of gold in Chili in the time of the Incas, Mr. Mackenna maintains that the primitive Chilenos were unacquainted with the use, the value and the working, the art of working it being learned from the Peruanos, and that even these employed it solely for ornamentation, and not as a medium of exchange. He refers to the imponderable accumulation of gold by the Incas, from the production of the mines of Peru and Chili, to the hawser of Huascar and the chain of the Jesuits of Santiago, and to the riches of the Temple of the Sun, and of the mines of Carabaya, mentioning numerous subsequently ascertained facts by way of verification. With regard to gold in Chili in the time of Don Pedro de Valdivia, the author refers to Marga-Marga, Quilacoya, La Imperial, Osorno and Nillareca, and he devotes an entire chapter to the gold crisis in the 17th century, dealing with the gold resurrection in the 18th century in the following chapter. After noting the favorable auspices under which the new century commenced for the gold miners of Chili, he explains that the general poverty produced by the catastrophee of the 17th century led to active work, and consequently to discoveries; and he refers in turn, and among other things, to the gold mine of Tiltil, in 1713, to the important gold discoveries in Copiapo in 1706, to the travels of Frezeir in Copiapo and La Serena, mentioning that the scientific opinions of Frezier as to the formation of gold correspond with the modern theories, to the antiquity of the Cangalla, to the mines of Lampagui and the reason of their abandonment, to the relative poverty of quartz mines as compared with gold placers in Chili and in other parts of the world, to the discovery of the mines of Potoria and Ligua, and to the abundance of gold in the neighborhood of Santiago, inducing an application for the establishment of a mint there in 1730, and Mr. Mackenna considers that the Santiago mint would not have been brought into existence either for silver, copper, or the *equivoccacion del rei*, had there not been the gold. Much interesting information is given concerning this mint, and it appears that the maximum production was reached in 1800 and 1810, and that during the century more than 2,000 quintals (100 tons) of gold was coined —"*la enorme suma de 2250 quintales, o sea una verdadera montana de oro accumulada durante un siglo.*" There are chapters on gold in the north of Chili (Atacama and Coquimbo) in the 18th century, and on gold in the central region (Del Bronco al Chivato) during the same period, whilst the succeeding chapter treats of Chili considered as the first gold-producing country of America and of the world, before the discovery of California. The two succeeding chapters are of great practical interest, since they deal with the questions of the waste and loss of gold in reduction in Chili, and of the decay of the age of gold in that country. California and Chili are then compared, and there are excellent accounts of the auriferous gravels of Catapilco, first prospected by Dr. Burnes, and of the quebradas of Malcara and Alvarado, in the province of Valparaiso.

But the matter referred to in Mr. Mackenna's volume which is the most likely to have a beneficial influence on the future of the gold-mining the industry of the country is that reserved for last chapter, which treats of Chilean gold legislation, and the necessity for its reform. Mr. Mackenna fully recognizes the excellency of the Mining Code of 1875, but very properly contends that it has many defects, the principal of which he has carefully pointed out, and the amendments which naturally suggest themselves are likely to be speedily carried out, for Mr. Vicuna is a Senator of the republic, and his motion for a reform of the mining laws was carried unanimously in July last, and was when the book left Chili (December last) in committee, so that it may be hoped that ere long Chili will have a mining code of so complete and liberal a character that her mines will be fully and profitably developed, and thus benefit the entire community.—*London Mining Journal.*

Oro Blanco and Arivaca Districts.

The Wareaw mill, in Oro Blanco, continues to do custom work on ore furnished by the neighboring mines, some of which are reported to be quite rich, especially the Golden Star, owned by Mr. A. S. Searle, the second-grade ore working at the mill over $90 per ton. Another valuable discovery has been made by Pickett & Co., just inside the Sonora line, known as the San Jose mine. Some of the richest ore seen in that section of the country is said to have come from it. The vein is large and has thus far shown improvement with corresponding depth. The Arivaca mill is crushing ore from Mr. Blanc's mine, which promises well to be the bullion king of that district. The Arivaca mill is under contract to crush 300 tons of the ore, none of which is said to work less than $60 to the ton. There is every possibility of the mine having a mill of its own. If the 300 tons now being worked give a satisfactory result, the mill will be at once put up. Reports vary as to its size, some say 20 and others that 60 stamps will be put in operation. The ledge is about 40 ft. in width and for fully 1,500 ft. comes out of the ground from 10 ft. to 20 ft. in hight. It had been located a half dozen times before coming into the hands of Mr. Blanc, its present owner, but as the surface of the rock was of no value, none of its previous owners had enterprise enough to break through the barren crust and into the free gold and chloride silver-bearing rock within. The formation of the quartz is a black hematite mixed with free gold and silver chlorides. The oxide of iron being exposed to climatic influences, decomposed, and partially dropping off hid the true nature of the ledge. A short distance down the hill from the ledge croppings, the earth was found to be pretty thoroughly impregnated with fine particles of gold, but as the surface appearance of the ledge indicated that it was barren, no further attention was given it until Mr. Blanc broke through the crust and revealed its true nature. Two men only are at work on it, but the rock is so soft that they can more than keep three teams constantly hauling to the mill ten miles distant. No sinking is being done at present; the men are simply drifting and taking out the ledge that crops above ground. Several wealthy Frenchmen in San Francisco have interested themselves, and as soon as the necessary arrangements can be made the mine will be developed for all it is worth.—*Arizona Citizen.*

THE POCKET MINES in and around Sonora continue to make the prospectors happy. Indirect reports are heard frequently of this or that one taking out a handsome sum. An old miner is said to have come upon $7,000 last week. Gold is being all the time found, but the lucky ones don't care for the world to know it, to be questioned to death and have themselves surrounded with others to interfere with their work.—*Tuolumne Democrat.*

The Engineer.

The Term "Engineer."

The extensive use of the term "engineer" in the sense of a man of education and scientific attainments, who designs work and directs the efforts of others, has raised the question in the minds of some members of the profession whether some other word than this cannot be devised for designating those men who tend engines. The English term "engine driver," has been suggested for this class of men, leaving the term "engineer" to be applied exclusively to the man of education. While this distinction may seem very desirable in the minds of some, we doubt if such a change is necessary. We think it hardly possible that any great confusion can ever arise. It certainly would be difficult to effect a change as radical as this in habits of writing and speaking that are already formed. Should the engineers who manage engines ever become ashamed of their brothers who design engines, it will be a proper thing for them to take some steps to originate a term by which they can be designated without fear of mistake. Seriously speaking, if any distinction in terms is to be made, or if a new name is to be introduced, it should belong to the educated members of the engineering profession. The usage of centuries is not easily changed by arbitrary distinctions. From time immemorial the term "engineer" has been applied to those in charge of engines—not necessarily steam engines, for the term is older than the invention of the steam engine, but to those who managed engines of war and mechanical devices of various kinds. The attempt at the present time, upon the part of the educated gentlemen of the profession, to restrict the use of the term "engineer" to themselves, to the exclusion of those who perhaps know as much, but who make less pretentions to academic honors, may be only another instance of an engineer hoist with his own petard.—*Iron Age.*

The New Revolution in Passenger Steamships.—When the artisans of Great Britain substituted the screw for the side paddle-wheels, and the compound engine for the old-fashioned low-pressure condensing engine, these improvements insured a revolution in the commerce of the world. There have probably been 500 modifications of the screw, all tending to make it a more perfect instrument of propulsion. A vast number of experiments have been made for the purpose of obtaining a composition which would stand the greatest wear and tear. Cast iron, steel, gun metal, composition, and brass, have all been used. The number of blades, the pitch and the revolution have all been made matters of scientific study. The compound engine, involving a double use of steam, secured a great increase of power with an immense reduction in the consumption of fuel. It is possible now to drive a large steamer 20 miles an hour with less fuel than was formerly used to obtain a speed of 12 miles an hour. The average time of the fastest steamers between New York and Liverpool is now about three hours less than 10 days. Notices from time to time have appeared in Eastern journals of a new steamship company which proposed to establish a line between the east end of Long island, at Fort Pond, and Milford Haven, in Wales. The programme of the company is to make the average time in seven days and five and one-half hours, at an average speed of 18 miles an hour. But at a speed of 20 miles an hour, for which the ships will be designed, the time would be six days and thirteen and one-half hours.

An Underground Railway at Naples.—The Naples correspondent of the London *Daily News* writes: The Naples Town Council has approved the project of Mr. Lamont Young for a subterranean railway uniting the different parts of the city, under the name of the Metropolitan Railway, and charged two assessors with the task of studying the technical and legal points of the plan. Part of the railway will be in the open air and part in tunnels under the hills that lie west and north of the city, and under some of the principal streets. Instead of steam, compressed air will be used, and the tunnels and carriages lighted with gas. One of the novelties of this railway is that from an underground station in the body of a mountain, called Vomero, it will be connected by means of a subterranean lift with an open air railway immediately above, running through the villages on the top of said mountain. From the underground station this lift will ascend more than 500 feet to reach the upper station on the top of the Vomero.

De Lesseps's New Project.—The French Cabinet Council has approved the scheme of M. de Lesseps's for cutting a canal through the neck of land dividing the Gulf of Gabes from the salt marshes and low-lying parts of the desert of Sahara to the south of Tunis. It is expected that the sea will, in virtue of this cutting, once more fill up a considerable portion of the Sahara. The political advantage to be obtained by the scheme, if it succeeds, will be the insulation of Tunis and Algeria by creating a water barrier between them and Tripoli. The cost of the canal, it is estimated, will be 65,000,000 francs.

Patents in Germany.—Last year there were 7,177 applications for patents in Germany; 4,339 were granted. This is the largest number granted in any year save one, 1879, when the number of patents issued was 4,410.

Useful Information.

South American Woods.—As the supply of hard woods for mechanical arts and for decorative purposes declines in this country, it is well to know where to look for the means of replacing it. Brazil seems to offer an inexhaustible supply of hard and decorative timber. Within an area of half a square mile, Agassiz counted 117 different kinds of wood, many of them admirably fitted by their hardness, tints and beautiful grains for the finest cabinet work. The *muirapinima*, or tortoise-shell wood, undoubtedly the most precious wood in the world, is found in large quantities on the tributaries of the upper Amazon, where the water can be easily used as a motive power. Many varieties of beautiful woods, easy rivals of the finest black walnut, are wasted yearly on the Amazon in amounts sufficient to veneer all the palaces of Europe. Maurice Morris, the explorer, believes that with the facilities which the Brazilian government is ready to impart to enterprising industry, the export of these commodities would yield enormous profits in a short time, while the amount of capital engaged need not be great. It is only necessary that these woods be introduced into the market to obtain a decided preference over those now most sought after in the two hemispheres.

A Whitewash that Will Stick and Wash.—We find in a German paper a formula for a wash which can be applied to lime walls and afterward become waterproof so as to bear washing. Rssenschek, of Munich, mixes together the powder from three parts silicious rock (quartz), three parts broken marble and sandstone, also two parts of burned porcelain clay, with two parts freshly slaked lime, still warm. In this way a wash is made which forms a silicate if often wetted, and becomes after a time almost like stone. The four constituents mixed together give the ground color to which any pigment that can be used with lime is added. It is applied quite thickly to the wall or other surface, let dry one day, and the next day frequently covered with water, which makes it waterproof. This wash can be cleansed with water without losing any of its color; on the contrary, each time it gets harder, so that it can even be brushed, while its porosity makes it look soft. The wash or calcimine can be used for ordinary purposes as well as for the finest painting. A so-called fresco surface can be prepared with it in the dry way.—*Scientific American.*

Smell of Paint.—To get rid of this most objectionable odor in a chamber or a living-room, slice a few onions and put them in a pail of water in the center of the room; close the doors, leave the window open a little, and in a few hours the disagreeable smell will have almost gone. Another method is to plunge a handful of hay into a pailful of water, and let it stand in the newly-painted room over a night; this plan is also effectual. The foregoing have the important advantage of being simple remedies, as the necessary materials are always easily obtainable. Yet another plan, but it is rather more complicated. Place a grate of lighted charcoal on a piece of flag or slate in the center of the room, and throw on it a handful or two of juniper berries; shut out all ventilation from the room for 24 hours. The doors and windows can then be opened, when it will be found that the nasty sickly smell of paint has entirely gone. The furniture may be left in the room during the process, and none of it will be injured. But the best way to avoid the smell of paint is by not having the painters in the house.

Black walnut can now be manufactured very cheaply. One part of walnut peel extract is mixed with six parts of water, and the wood is coated with the solution. When the material is about half dry a solution of bi-chromate of potash with water is rubbed on it, and then your walnut is ready. Furniture dealers have been known to make excellent walnut from very poor pine, but the difference was slightly perceptible; however, this method is said to defy detection.

Preventing Forest Fires.—The idea that the best way to prevent forest fires is to burn all trash and small undergrowth annually, seems to gain popularity. One who is well posted in forestry matters says: "If the undergrowth is kept down and dead matter not allowed to accumulate, there will be no fire to hurt the live trees. We know a piece of woods that is burned under every year by sparks from the Reading railroad locomotives, but the standing timber has never been injured. It will not cost a thousandth part as much to clear out all the brushwood in the United States as we lose in one year by the forest fires, and the true way to preserve our forests must start from just here. At any rate, this idea removes the great objection to forest planting—that it may get burned. If rank vegetation is kept down for a few years during the growth of the forest, it will, by its own shade, keep down the growth thereafter."

The Gutta Percha Supply.—Reports from Brazil show that the supply of gutta percha, which is used in insulating underground wires, is fast giving out, and will be exhausted in 30 years. It is said that this prospect of a scarcity in insulating material is one of the chief reasons for the strong opposition by interested parties to underground telegraphy.

When to Cut Timber.—July and August are esteemed the best months in which to cut timber, especially for fuel, in so far as durability goes. The growth of the year is then nearly over, and if the trees are allowed to lie until the green foliage dries upon them, the greater portion of the sap is thereby withdrawn from the wood, and the seasoning is rapid and perfect. When cut in midsummer, insects are less liable to attack the wood, and this is an important point with some kinds of timber.

Machinery vs. Cheap Labor.—It is one of the most striking illustrations of the power of machinery that cotton can be brought from the far interior of India, on the backs of bullocks to the sea, shipped around the Cape of Good Hope to England, manufactured, shipped back by the same route, paying repeated commissions and profits, and undersell the native manufacturer on the spot where the raw product is grown, and where labor is considered well paid at 15 cents a day.—*Senator Bayard.*

Cleaning Lime choked Pipes.—Feed, water and other pipes frequently become choked with lime incrustation, causing great annoyance. The following plan has been suggested as a remedy: After plugging one end up securely, pour the pipe full of coal oil, letting it stand over night, when the whole mass will probably slide out. Pipes have been cleared of incrusted matter in this manner which before were regarded as useless.

An experienced cabinet maker says that the best preparation for cleaning picture frames and restoring furniture, especially that somewhat marred and scratched, is a mixture of three parts of linseed oil and one part spirits of turpentine. It not only covers the disfigured surface, but restores wood to its original color, leaving a luster upon the surface. Apply with a woolen cloth, and when dry, rub with woolen.

The spruce gum industry of Maine is represented to be in a highly flourishing condition. Men who range the woods collecting the gum make good wages, selling the article for 40 cents a pound. Altogether, residents of the State obtain $40,000 yearly by the sale of the article.

Rust may often be removed from steel tools by immersing them in kerosene oil for a few days. This loosens the rust so that it may be rubbed off. Where the rust is not very deep-seated, emery paper will do; but if of long standing, the tools must be refinished.

Good Health.

Is Cold Weather Healthful?

The notion that cold weather is healthful has doubtless sufficient foundation in fact to prevent it being classed among "popular fallacies," but, like the Constitution of the United States, it may, perhaps, suffer amendment to advantage. Of course, by cold weather is not meant that which the thin-blooded, the effeminate and the invalid consider such. Anything approximating the freezing point is sufficient to set them quaking and complaining. We demand for cold weather a temperature that any healthy, vigorous individual will concede to be such—zero is about right. Yes, it is cold when the snow crackles, when the very best varnish will occasionally crack on the sleigh, and when the cheeks and ears of the sleigh's occupants wear a hectic color; while their noses and fingers, and presumably their toes, are of a frigid blue. We take it that all but those of exceptional robustness are vulnerable at these points to a zero temperature. These tingling fingers and aching toes are trifling matters, to be sure, but it will not be claimed that they are the indication of a sudden influx of health. May they not be warnings? The effect of extremely cold air upon the lungs or on a rheumatic shoulder is often unmistakably bad. It seems to us that right here is indicated where the line should be drawn between a healthy and unhealthy degree of cold. Let the test be comfort—fingers and toes included. Down to this point where the brisk air continues to produce a pleasurable exhilaration, it is probably healthful, but when the extremities, though well protected by wraps without and a good circulation within, grow cold, this should be regarded as a warning that the healthful limit has been passed. We beg to suggest caution in drinking these drafts of health proffered by old Boreas, as, like some other iced beverages, they might be more wholesome without the ice.—*Metal Worker.*

Dead Drunk.—M. Grehaut made an interesting communication to the Biological Society of Paris at a recent meeting, on the subject of fatal doses of alcohol. In order to determine what quantity of alcohol is present in blood when death ensues from drinking it in large quantities, he made a series of experiments, all of which gave the same results. By means of an œsophageal syringe, he injected into the stomach of a dog 30 grams of alcohol every half hour until the dog died. He then collected some of the blood of the animal, scrupulously taking the same precautions as when an analysis of the gases present in the blood is made. He then distilled it *in vacuo*, using for the purpose, with the necessary modifications, a mercury pump, such as is employed for analyzing the gases of the blood. M. Grehaut's experiments convince him that death happens when the blood of the animal presents the proportion of one part of absolute alcohol to 100 of blood; that this substance acts directly on the constituent elements of the blood; that the condition known as "dead drunk" exists when drunkards continue drinking, but when the alcohol imbibed ceases to be absorbed and the blood presents the proportion of one part of alcohol to 195 of blood; that is to say, almost the half of the quantity present in the blood when death is caused by drinking. M. Grehaut believes that, if death from drunkenness is less frequent than might be expected, it is because drunkards generally stop drinking when this proportion exists (one in 195).

A Rich, Unprospected Region.

The finest field for profitable prospecting there is on this coast, or on the continent perhaps, is that embraced within lines drawn westerly from the Dog Town placer diggings to the summit of the Sierra, north of the head of Green creek, thence southerly along the summit to Tioga Hill, thence south-westerly and west of the summit (for the precious metals are found on both sides of the summit south of the middle fork of the Tuolumne), to the headwaters of the north fork of the San Joaquin, thence easterly across the summit to the head of Deadman's creek, and thence northerly along the eastern base of the range to the place of beginning. This area embraces Jordan, Castle Peak, Homer, Tioga and Prescott districts, and some territory not embraced in either; and portions of Mono, Tuolumne, Mariposa, and Fresno counties, though most of it is in this county. The mountains are lofty and rugged, but can be traversed at almost any point by saddle or pack animals; water is everywhere abundant, and timber and grass plentiful in every canyon and on every slope; the climate is delightful during the entire summer, the nights being cool, and the country is as safe for travelers as the San Joaquin valley, the few fierce beasts that stray up to that altitude finding plenty of game to satisfy their appetites. The country is rich in gold, silver (in all its forms and combinations), zinc, antimony and galena. Though many valuable ledges have already been located and are now being developed in both Homer and Tioga, neither district has yet been half prospected. Lundy, being near the center of the region bounded—being in the center of Homer, four miles from the center of Jordan, six miles from the head of Green creek, nine miles from the center of Tioga, and 16 miles by good wagon road from Prescott—would be the best place to outfit at, as all articles necessary can be procured here at as low rates as they can be purchased elsewhere. Accurate assays can also be obtained here, and Tioga will probably have an assay office within a few months.—*Homer Mining Index.*

Fat of the Old and Young.—The influence of age on the chemistry of the body is a department of physiology as yet very imperfectly investigated. The composition of the fat, however, at different periods of life, is obviously one of the simplest problems connected with the question, and it has been lately investigated by Lanquer. In newly born children the fat has a particularly firm consistence, constituting a peculiar tallow-like mass, with a melting point of 45° C. The fat of adults, however, separates at the ordinary temperature of a room into two layers. The upper layer is completely fluid, translucent and of a yellowish color, and only solidifies at temperatures under zero, Centigrade. The lower layer is a crystalline mass, which has its melting point at 36° C. Further investigations were made on about a kilogram of each kind of fat. The fatty acids obtained from the fat of newly born children (after precipitation with hydrochloric acid) were found to melt at 51° C., and those obtained from the fat of adults had a melting point of 38° C. The former was found to contain three times as much palmitic and stearic acid as the latter. The palmitic acid preponderated over the stearic in each kind of fat, but much more in that of children than of adults, the proportion being in the former four to one, but in the latter nine to one. There are 86% of oleic acid, 8% of palmitic acid, and 2% of stearic acid in the fat of an adult; whereas in the child the proportion of oleic acid is only 65%, the palmitic acid 28%, and the stearic acid 3%.

Success in life depends, to a very great extent, on a good digestion, a trustworthy set of nerves, and the power of being always "there or thereabouts" when the course is cleared. The time is rapidly approaching when an interview with a really pleasant food will afford a most charming change and welcome relief from the most overwhelming knowingness and priggishness of our premature brethren. Nor is the mischief of the masculine gender only. The Juggernaut car of the driving and competitive system is crushing beneath its wheels many of our daughters and sisters. The female candidates for the "locals," the aspirants for the class lists and the trines, go in for a strain to which the average female organization is unequal. The way is strewn with wrecks, broken hopes, broken health; but we suppose that the great principle of the survival of the fittest will here assert itself, and that in a future day it will be said of some great light that "his mother was 'senior wrangler,' bracketed with the Bishop of Banbury."—*London Globe.*

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Passing Events.

The local papers say that the rush to Wood River and to Butte still continues. Many hundreds of men are going into those regions with high hopes doomed to disappointment, unless they are provided with means to prospect with. There are so many there now that those in search of employment will find it difficult to procure. For prospectors, however, the regions alluded to hold out apparently good inducements.

Mining news generally appears to be pretty good. In this State men are busy everywhere, and the mines are doing well. Up on the Comstock they are looking for bonanzas, and no doubt, should one be found, matters along the lode would look up again.

We shall, on the 17th inst., issue a double number of the MINING AND SCIENTIFIC PRESS, filled with matter more or less pertaining to "hydraulics," and intend to make an exceedingly interesting number. Any of our readers who may be able to contribute anything of interest in this line we shall be glad to hear from.

MR. LEWIS CHALMERS, manager of the Isabelle G. & S. Mining Co., of Alpine county, has left for London, England, intending to be absent about two months. The recent developments in the company's mine (the Stella) are deemed of sufficient importance to require the manager's immediate presence at the home office. The building of a much-needed mill nearer the mine and the erection of suitable hoisting works will probably receive the proper attention of the manager.

Cam Shafts and Cams.

In California quartz mills the cam shaft is a round shaft of iron which is smoothly turned and finished, having one or two key seats or grooves cut in it lengthwise, for the purpose of securing the cams in their places. The shaft rests in boxes, which are usually supported by cobolders cut in the upright parts of the battery frame. Cam shafts vary in diameter from four to six or seven inches, according to the number of cams to be fixed upon them and the weight of the stamps to be raised. In some mills a single cam shaft is made long enough to carry all the cams for as many batteries as there may be. This is an inconvenient arrangement, however, and in this State and Nevada it is the almost invariable practice to make the cam shaft short, a separate shaft being employed for each battery of five stamps, or, in some cases, one shaft for two batteries.

Separate cam shafts are preferred, on account of the independence of each battery, so that if one be stopped by any accident to the cams or the stamps, or for repairs of any kind, the operation of the others is not interrupted. Each shaft in such case is driven by its proper pulley, which receives its motion, by means of belting, from a counter shaft. The number of stamps in each battery is commonly five. The order in which they are allowed to drop is not always arranged in the same manner in different mills, but the desired conditions are, that the weight of the stamp to be raised may be uniformly distributed on the cam shaft, so that the weight of metal to be lifted may be as nearly as possible the same at any moment of the revolution, and that each stamp may fall effectually upon the material to be crushed, and, by the force of its blow, aid in the proper distribution of the stuff among its neighboring stamps.

If the stamps are allowed to rise and fall in regular succession from one end of the battery to the other, the material is apt to accumulate at one end, and the effective duty of the stamps is thereby diminished. The order must therefore be varied. In a five-stamp battery a common arrangement is to let fall first the middle stamp, then the end stamp on the right, then the second stamp on the left, then the second stamp on the right, and finally the end stamp on the left. The order in which the stamps are to fall being determined, it is carried into effect by fixing the cams on the shaft in such position that each cam, by the revolution of the shaft, will lift its respective stamp at the desired moment. For this purpose the key seats cut in the hub of the cam must be determined with care; one common key seat being cut in the cam shaft, when the desired position of any given cam has been ascertained, the key seat on the hub is cut to correspond with that of the shaft.

End Lines and Side Lines.

The big mining suit of Tranquillity M. Co. vs. the Head-Center M. Co. was decided at Tombstone last week. There were some curious points involved in this controversy, bringing in, as it did, the question of end lines and side lines of mining claims. The suit was brought last December, and a temporary injunction granted restraining the Head-Center from working over the side line of the Tranquillity. According to the *Epitaph*, the Head-Center is a triangular claim, worked on the dip of the ledge beyond the line of the Tranquillity. The Head-Center claimed they had a right to follow the dip of the ledge so long as the croppings were in their grounds, even though the dip of the ledge passed beyond the vertical plane extending downwards through the line which cut the ledge on its strike. The Tranquillity maintained that said line crossing the ledge on its strike was an end line of the Head-Center. This position of the Tranquillity was maintained by the court, and the judge instructed the jury that said line must be considered an end line for the two claims, and, therefore, instructed that a verdict he entered for the Tranquillity.

Under this case, the first authoritative decision has been promulgated as to the rights of a triangular location, and makes the side of the triangle crossed by a ledge the end lines of the locators, irrespective of the dip of the ledge. The settlement of this case ends all litigation as to the rights of the different claims on Contention hill. The Tranquillity company have already started work on that part of the ledge which was in controversy, and in which large quantities of ore are exposed. Arrangements have been made for the use of 10 stamps of the Girard mill, and in the course of a week or ten days the Tranquillity will be shipping bullion, and gives promise of being a fine paying property. It is understood that the Tranquillity made an offer to compromise the case within a couple of months by giving the Head-Center 50,000 shares of Tranquillity stock in exchange for the acknowledgment of the demands won in the court. A bevy of distinguished lawyers contended for the demands of the two companies. The Tranquillity was represented by Lewis & Berry, Stewart & Harrin, and Earl, Smith, Campbell and Robinson. The Head-Center had Garber & Thornton, George R. Williams, and R. S. Mesick.

Timber on Mineral Lands.

A very important decision, of great interest to the mining community, has just been rendered by H. M. Teller, Secretary of the Interior, on the question of timber on mineral land. In view of its importance we print it in full:

My attention has been called to a number of cases, reported by special agent Hardin, of the so-called trespassers in cutting timber on mineral land in the Territory of Dakota. Notably, in the cases of Frank P. Hardin, who is charged with cutting 72 cords of wood; Peter T. Bye, charged with cutting 25 cords; Henry Bressert, charged with cutting 60 cords; J. H. Damon, charged with cutting a like amount; Frank Keller charged with cutting 47 cords, and Albert Holman, charged with cutting 100 cords. All of this wood appears to have been cut off of mineral lands of the United States. It also appears by the report of the special agent that the persons charged with the trespass have, in cutting this wood, conformed to the rules of the department as to size of the timber to be cut, etc. It is now proposed to compromise with these persons by allowing them to pay for the wood, at the rate of 50 cents per cord. I do not think, on the statement of facts made by the special agent in the cases of Hardin and Peter B. Bye, that they have been guilty of a trespass in cutting such. I understand that the facts are substantially the same in all the cases mentioned.

The Acts of Congress.

The Act of Congress, approved June 3, 1878, entitled "An Act authorizing the citizens of Colorado, Nevada and Oregon, to fell and remove timber from the public domain for mining and domestic purposes," clearly authorizes the cutting of timber on mineral lands of the United States for domestic uses. It does not appear that Peter Bye, or any other of the parties complained of, cut wood for transportation from the Territory, and if cut to be used in Dakota, it is clearly for domestic use. It has been alleged that the Act of June 3, 1878, does not apply to persons cutting timber on mineral lands for sale, and that to enable any person to have the benefit of that Act, he must cut timber for his personal use, and not for sale. Such a construction defeats the very intent of the Act which was to allow the settler on mineral lands to have the benefit of the timber thereon growing for use, within the Territory or State where it grew. It cannot be supposed that Congress intended to say by that Act to the inhabitants of the mineral regions, that while they might go on the lands of the United States and cut timber for their use, yet they could not employ others to cut timber for them, or purchase it of those who had cut and prepared it for use. Large and prosperous communities had settled on the mineral lands of the United States, by and with the consent of Congress.

The Occupation Lawful.

A statute had been passed declaring such occupation lawful, and provisions were made for securing a title to the mines that should be discovered and improved on such lands, yet no provisions had been made by which a title could be secured to the timber growing on such lands, until a mine had been discovered thereon. To have restricted the inhabitants to the use of such timber as should be found on mineral claims alone, would have been folly, for in many instances the mineral claims are destitute of timber. Whole mining districts are frequently compelled to procure their supply outside of their districts, either because the timber in such districts had been carted off and used, or because the district was without timber when first settled.

A Precept by Custom.

The area of the territory occupied by actually located mineral claims is entirely too small to supply the communities with timber from such claims alone, and so it became a necessity to appropriate timber on Government lands. In the absence of a law authorizing the purchase of either the timber or the land on which it grew, from the first settlement of mineral regions to 1876, such had been the custom of the miners in all mineral regions. Cities and towns, with churches and schoolhouses, had been built with timber so taken from the public land. Appeals had been made to Congress, from time to time, to provide by law for the securing of the title to timber on mineral lands. Congress, with the wise policy of keeping the mineral lands of the United States open to further exploration and occupation, had declined to pass any law by which timber on such lands could be monopolized by speculators and capitalists. Woodchoppers and lumbermen had, from the first settlement of the mineral regions, cut from the mineral lands wood, mining timbers and lumber for buildings, and sold the same to those who could not or did not wish to cut such timber for their own use. It was practically impossible for millmen, miners, and other inhabitants of the country, to go out and fell trees that were to be used to build their mills, timber their mines or supply their families with fuel. About the time of the passage of the Act of 1878 it was alleged that such cutting was in violation of the law, and ought not to be allowed.

A Prevention Worse than a Cure.

To have prevented such cutting would have compelled the abandonment of nearly, if not quite all, the mineral regions of the States and Territories named in the Act. The Act was passed to establish by positive enactment a right claim and exercised without interference on the part of the Government for a period of about 30 years. The construction heretofore given to it by this department has defeated the purposes of the Act, and has not been of any advantage, either to the Government or the people residing on such mineral lands. In most of the regions included in the Act referred to, the timber is of but little value for use outside of the neighborhood in which it grows. A comparatively small amount would bear transportation out of the State or Territory, and it cannot be used more advantageously to the people and the Government than in the product of precious metals. If the timber is cut having reference to the rule established by the department as to size, etc., no complaint ought to be made. It has been suggested that the use of wood in the quartz mills and reduction works in the mineral regions is not a use for mining purposes.

Indispensable Mills and Works.

I do not think there is anything in that suggestion. Quarts mills and reduction mills are indispensable to a mining community, and such use is clearly within the provisions of the law, and the consumer as fully protected by it as if he had consumed it in his own dwelling. You will, therefore, instruct the special agents now in the States and Territories named in the Act of June 3, 1878, to conform to the suggestions herein. The great object of a Governmental supervision of cutting timber in those States and Territories ought not to be to compel the payment for timber so cut, but to prevent an unnecessary waste by cutting the small trees under the size prescribed by the department, and to prevent a waste by fires and other means.

Small Mines.

It is not always the big mining company, with its complete outfit of mill, hoisting works, superintendent, president, etc., that makes the most money for its owners; nor is it always the mine whose name figures in the list of bullion shipments most frequently that ships the most bullion. The small mines here and there that are being worked successfully by a few men pay far larger profits to the individuals, as a general thing. There are in this State, for instance, hundreds of mines that largely swell the aggregate bullion production of California, but which people never hear of. The owners, working them quietly for what they are worth, do not care for any publicity, and are averse to publishing the results of their labor. Some of these are worked for years, yet few people except in the immediate vicinity, have ever heard the name of the claim or knew of its existence.

A case in point is shown in the Gold Hill mine, Smith's flat, Calaveras county, owned by George Osborn. The *Mountain Echo* says that this mine is what is usually termed a pocket claim, never having been worked by any other means than the pan. It was discovered about 25 years ago, and has been worked most of the time since. Statistics show that over $50,000 have been extracted from it during that time. Now, at this late day, a simple 10-ft. arastra is being put up to work the rock. This is one of many other claims worked in a quiet manner for many years by one or two men.

In El Dorado county, Armstrong and Baldwin took out $3,000 week before last from the Rich Gulch mine, and last week took out $1,000 more. This makes a total of fully $17,000 taken from this mine by two men's work, nearly all of which was taken out within the last two months. The Georgetown *Gazette*, in commenting on this, says:

These gentlemen are highly deserving of their success, which has been won through the most determined and commendable enterprise. While many have been busy upon the street crying down the mines, these gentlemen have had faith in mining and worked with a determination to win. There are others equally deserving of mention for their mining enterprise, and scarcely a month rolls by without some one of them making a good strike. Mining pays. How many men can you find who have mined to any extent in this district who have not made at one time, at least, a reasonable stake, say from $2,000 to $10,000 and upwards, enough to have secured a good home with. Energetic and careful mining, as a business, pays better to-day than farming. The trouble is, not one miner out of a dozen takes care of his money when he gets it. Is it not a fact that nearly all the men in Georgetown who are afflicted with the mania of "running down" our mining industry, have on one or more occasions done well in the mines. Of course they failed, through various causes, to retain their financial footing, but that is not the fault of the mines. Is it not a fact that there are men to-day doing well at mining, who will, in the future, be among those who cry down the mining industry?

THE Mono Lake Hydraulic mining company has turned the water upon its new and extensive field of operations near Mono lake, between Thomson's ranch and the mouth of Mill creek. At present only ground sluicing is going on, Mill creek being allowed to run, full head, over the slope; but as the ground is being rapidly cut away, and a high breast formed, the hydraulic pipes and giants will soon be placed in position. This ground is said to prospect well.

Production of the Precious Metals.—No. 11.

[An abstract of the Census Monograph on the Bullion output of the country.]

Reaume of Production Statistics.

The total product of each State and Territory, including the yield of the deep mines from ore which was raised prior to, but reduced during the census year, and also the silver contents of placer gold, appears in the complete exhibit contained in the following table, which shows the aggregate bullion output of the United States for the year ending May 31, 1880:

Production by Geographical Divisions.

PACIFIC DIVISION.

State or Territory.	Product. Gold.	Silver.	Total.
Alaska	$ 5,951	$ 51	$ 6,002
Arizona	211,960	2,325,826	2,727,792
California	17,150,254	1,150,886	18,301,840
Idaho	1,479,658	464,550	1,944,205
Nevada	4,888,247	12,430 666	17,318,913
Oregon	1,097,700	27,793	1,125,493
Utah	291,555	4,743,090	5,034,645
Washington	135,800	1,019	136,819
Total	$25,201,828	$21,143,881	$46 405,709

DIVISION OF THE ROCKY MOUNTAINS.

Colorado	$2,090,900	$16,549,274	$19,249,174
Dakota	3,305,846	70,813	3,376,659
Montana	1,805,768	2,905,066	4,710,834
New Mexico	49,354	392,337	441,091
Wyoming	17,821		17,321
Total	$7,878,189	$19,917,490	$27,795,070

EASTERN DIVISION.

Alabama	$ 1,300		$ 1,300
Georgia	81,030	$ 332	81,362
Maine	3,000	7,200	10 200
Michigan		25,858	25,858
New Hampshire	11,000	16,000	27,000
North Carolina	118,955	110	119,095
South Carolina	13,041	56	13,097
Tennessee	1,998		1,998
Virginia	9,322		9,322
Total	$239 646	$49,586	$289,232

SUMMARY.

Pacific Division	$25,201,828	$21,143,881	$46,405,709
Division of the Rocky Mountains	7,878.189	19,917,490	27,795,679
Eastern Divieion	239,646	49,580	289,232
Total	$33 379,663	$41,110,957	$74,490,620

The relative quota contributed by each of the three great arbitrary divisions into which the country has been apportioned is indicated in the foregoing abstract, from which it will be seen that the Pacific division furnished 75.68% of the gold, 51.43% of the silver and 62.43% of the total. The division of the Rocky mountains yields 23 60% of the gold, 48.45% of the silver, and 37.18% of the total. The prodoot of the Eastern divisioa represents .72% of the gold, .12% of the silver and .39% of the total.

The bullion produot of the deep mines of the United States for the year nnder review amounted to 35 tons 900 lbs. avoirdupois (1,033,973.1 ozs. Troy) of fine gold, and 1,087 tons 900 lbs. avoirdupois (31,717,299 ozs. Troy) of fine silver. That of the placer mines weighed 19 tons 1,824 lbs. avoirdupois (580,766.6 ozs. Troy) in fine gold, witb which were alloyed two tona 1,498 lbs. avoirdupois (80,177 ozs. Troy) of silver. The total weight of hne bullion was no less tban 55 tons 724 lbs. avoirdupois (1,614,739.7 ozs. Troy) of gold, and 1,090 tons 398 lbs. avoirdupois (31,797,476 ozs. Troy) of silver. These huge figures may be better grasped, perhaps, by considering that the gold represents five ordinary carloads, while a train of 109 freigbt cars of the nsoal capacity would be required to transport the silver. Historians have stated that dnring the early Spanish ocnpation, whole galleons were freighted exclnsively with silver from the mines of Mexioo and Peru. This would bardly seem to be an exaggeration, in view of the fact that the preseot annual product of the United States would suffice to form the full cargo of a large modern vessel.

Comparisons.

The relative proportion of placer gold to that produced by the deep mines, the percentage in each class of product of the preoious metals from the several mining regions of the United States, the average yield per square mile and per oapita in different localities, and the rank of tbe States and Territories in prodnctiveness, are indicated in tbe following exhibits:

Percentage of Placer Gold and Gold from Deep Mines in Total Gold Product.

State or Territory.	Placer Mines.	Deep Mines.
Alabama		100.00
Alaska	100.00	
Arizona	14.16	85.84
California	50.03	49.97
Colorado	3.77	96.23
Dakota	1 54	98.46
Georgia	82.51	17.49
Idaho	59.42	40.58
Maine		100.00
Montana	64.40	35.60
Nevada	1.02	98.98
New Hampshire		100.00
New Mexico		100.00
North Carolina	3.94	96.06
Oregon	84.39	15.61
South Carolina	50.16	49.84
Tennessee		100.00
Utah	6.86	93.14
Virginia		100.00
Washington	87.63	12.37
Wyoming		100.00
United States (includi'g Alaska)	35.97	64.03

Relative Production of the States and Territories.

State or Territory	Gold. Placer Mines. Per cent.	Gold. Deep Mines. Per cent.	Total Gold. Per cent.	Silver. Per cent.	Total. Per cent.
Alabama		0.01	0.01		
Alaska	0.05		0.02		
Arizona	0.25	0.85	0.63	5.66	3.40
California	71.47	40.09	51.38	2.80	24.70
Colorado	0.87	12.16	8.09	40.25	25.85
Dakota	0.42	15.23	9.90	0.17	4.52
Georgia	0.56	0.07	0.24		0.10
Idaho	7.32	2.81	4.43	1.13	2.60
Maine		0.01	0.01	0 02	0.01
Michigan				0.06	0.03
Montana	9.58	3.01	6.41	7.07	6.32
Nevada	0.41	22.64	14.64	30.24	23.24
New Hamphire		0.05	0.03	0.04	0.03
New Mexico		0.23	0.15	0.95	0.59
North Carolina	0.04	0.53	0.36		0.15
Oregon	7.75	0.80	3.29	0.07	1.49
South Carolina	0.05	0.03	0.04		0.01
Tennessee		0.01	0.01		
Utah	0.16	1.27	0.87	11.54	6.75
Virginia		0.04	0.03		0.01
Washington	0.99	0.08	0.41		0.18
Wyoming		0.08	0.05		0.02
Total	100.00	100.00	100.00	100.00	100.00

Average Product per Square Mile for the Year Ending May 31, 1880.

States and Territories.	Gold.	Silver.	Total.
Alabama	$ 0.02		$ 0.02
Alaska	0.01		.01
Arizona	1.37	$ 20.58	22.45
California	108.30	5.84	115.14
Colorado	25.98	159.22	185.20
Dakota	22.17	.48	22.65
Georgia	1.36		1.36
Idaho	17.45	5.30	22.75
Maine	.09	.22	.31
Michigan		.44	.44
Montana	12.36	19.83	32.19
Nevada	44.16	112.29	156.45
New Hampshire	1.18	1.72	2.90
New Mexico	.40	3.20	3.60
North Carolina	2.28	.002	2.282
Oregon	11.43	.20	11.63
South Carolina	.43		.43
Tennessee	.05		.05
Utah	3.43	55.82	59.25
Virginia	.22		.22
Washington	1.95		1.95
Wyoming	.18		.13
United States (including Alaska)	9.31	11.44	20.75
United States (not including Alaska)	11.03	13.55	24.58
United States (including only the States and Territories producing gold and silver, with Alaska)	14.68	18.02	32.70
United States (including only the States and Territories producing gold and silver, and not including Alaska)	19.44	23.88	43.32
Average for Colorado, California, Nevada, Utah, Montana, Dakota, Arizona and Idaho	33.47	42.64	76.11

Average Product Per Capita for the Year Ending May 31, 1880.

States and Territories.	Gold.	Silver.	Total.
Alabama	$ 0.001		$ 0.001
Alaska	.20		.20
Arizona	5.24	$ 57.51	62.75
California	19.84	1.25	21.09
Colorado	13.93	85.16	99.05
Dakota	24.46	.52	24.98
Georgia	.05		.05
Idaho	45.38	13.78	59.16
Maine	.005	.011	.016
Michigan		.02	.02
Montana	46.11	73.98	120.09
Nevada	78.51	199.63	278.14
New Hampshire	.03	.05	.08
New Mexico	.41	3.28	3.69
North Carolina	.03	.00007	.08
Oregon	6.28	.11	6.39
South Carolina	.01		.01
Tennessee	.001		.001
Utah	2.03	32.94	34.97
Virginia	.005		.005
Washington	1.81		1.81
Wyoming	.83		.83
United States (including Alaska)	.66	.82	1.48
United States (not including Alaska)	.66	.82	1.48
United States (including only the States and Territories producing gold and silver, with Alaska)	2.60	3.20	5.80
United States (including only the States and Territories producing gold and silver, and not including Alaska)	2.61	3.21	5.82
Average for Colorado, California, Nevada, Utah, Montana, Dakota, Arizona and Idaho	21.05	26.80	47.85

Rank of the States and Territories in Actual Product, for the Year Ending May 31, 1880.

Gold.	Silver.	Total.
1. California	1. Colorado	1. Colorado.
2. Nevada	2. Nevada	2. California.
3. Dakota	3. Utah	3. Nevada.
4. Colorado	4. Montana	4. Utah.
5. Montana	5. Arizona	5. Montana.
6. Idaho	6. California	6 Dakota.
7. Oregon	7. Idaho	7. Arizona.
8. Utah	8. New Mexico	8. Idaho.
9. Arizona	9. Dakota	9. Oregon.
10. Washington	10. Michigan	10. New Mexico.
11. North Carolina	11. Oregon	11. Washington.
12. Georgia	12. New Hampshire	12. North Carolina
13. New Mexico	13. Maine	13. Georgia.
14. Wyoming		14. New Hampshire
15. South Carolina		15. Michigan.
16. New Hampshire		16. Wyoming.
17. Virginia		17. South Carolina
18. Alaska		18. Maine.
19. Maine		19. Virginia.
20. Tennessee		20. Alaska.
21 Alabama		21. Tennessee.
		22. Alabama.

Rank of the States and Territories in Product per Square Mile, for the Year Ending May 31, 1880.

Gold.	Silver.	Total.
1. California	1. Colorado	1. Colorado.
2. Nevada	2. Nevada	2. Nevada.
3. Colorado	3. Utah	3. California
4. Dakota	4. Arizona	4. Utah.
5. Idaho	5. Montana	5. Montana
6. Montana	6. California	6. Idaho.
7. Oregon	7. Idaho	7. Dakota.
8. Utah	8. New Mexico	8. Arizona
9. North Carolina	9. Dakota	9. Oregon.
10. Washington	10 Michigan	10. New Mexico.
11. Arizona	11. Maine	11. New Hampshire.
12. Georgia	12. Oregon	12. North Carolina.
13. New Mexico	13. North Carolina	13. Washington.
14. New Hampshire		14. Georgia.
15. South Carolina		15. Michigan.
16. Virginia		16. South Carolina.
17. Wyoming		17. Maine.
18. Maine		18. Virginia.
19. Tennessee		19 Wyoming.
20. Alabama		20. Tennessee.
21. Alaska		21. Alabama.
		22. Alaska.

Rank of the States and Territories in Product Per Capita, for the Year Ending May 31, 1880.

Gold.	Silver.	Total.
1. Nevada	1. Nevada	1. Nevada.
2. Montana	2 Colorado	2. Montana.
3. Idaho	3. Montana	3. Colorado.
4. Dakota	4. Arizona	4. Arizona.
5. California	5. Utah	5. Idaho.
6. Colorado	6. Idaho	6. Utah.
7. Oregon	7. New Mexico	7. Dakota.
8. Arizona	8. California	8. California.
9. Utah	9. Dakota	9. Oregon.
10. Washington	10. Oregon	10. New Mexico.
11. Wyoming	11. New Hampshire	11. Washington.
12. New Mexico	12. Wyoming	12. Wyoming.
13. Alaska	13. Alaska	13. Alaska.
14. North Carolina	13. Maine	14. North Carolina.
15. Georgia		15 New Hampshire.
16. New Hampshire		16. Georgia.
17. South Carolina		17. Michigan.
18. Virginia		18. Maine.
19. Maine		19. Virginia.
20. Tennessee		20. Tennessee.
21. Alabama		21. Virginia.
		22 Alabama.

Production Unaccounted for in the Preceding Tables.

In addition to the returns received direotly from the mines, there are several minor points to be included in the total yield. A larger item tban it is usually oonsidered to be is the annual hoarding of rich speoimens. This is not accounted for in the mine produotion as reported. While it is impossible to state the aotnal amount thos absorbed with any degree of preoision, a careful estimate would place the value of the gold nuggets and ore annually added to the cabinets of collectors at not less than $150 000, and that of the silver ore at about $50,000. This, in view of the great number of mineral collections maintained throughont the mining territory, is certainly not an over-estimate.

There is also quite an extensive manofacture of gold quartz into jewelry and souvenirs, particularly in San Francisco. The value so absorbed does not probably fall sbort of $50,000 annually. In 1870 the United States mining oommissioner estimated the amount of gold hoarded as specimens or worked up by local jewelers at $400,000. The same authority, at that period, estimated the annual loss of gold-dust in handling as currency at $100 000. As the practice of using dnst for money has almost disappeared, the amonnt so lost is now very small.

Another indefinite quantity is the value of precious metal lost in melting, in assay grains, etc. Summing up the estimates for these additional items, the following result is reached:

Production Unaccounted for In Tabulation

	Gold.	Silver.	Total.
Bullion product shown in preceding tables	$33,379,663	$41,110,957	$74,490,620
Estimated value of specimens hoarded	150,000	50,000	200,000
Estimated value of gold quartz made into jewelry and souvenirs	50,000		50,000
Estimated value of gold dust lost in handling as currency	10,000		10,000
Estimated loss in melting and assaying assay grains, etc	20,000	10 000	30,000
Total	$33,000,763	$41 170,957	$74,780,020

Discount and Market Value.

The figures given in the tables are of assay values, and are productions therefore considerably higher than the actual market value. Disregarding express charges, commissions, and oost of refining and coining, there is still a large deduction to be made for this discount, in estimating the cash value of the bullion to the producers. Assuming the gold to have brought on the average $20 per Troy ounce, and the silver $1.12½ per Troy ounce, the cash received would have been $32,394,794 for the gold, $35,772,160 for the silver, and $68,166,954 total. The loss to the miners, as compared with the full assay valoe, would therefore have been $984 869 on the gold, $5,338,797 on the silver, and $6,323 666 altogether, or about one thirty-fourth of the full gold coining value, over one-eigth of the nominal silver value, and over one-twelfth in all, during the single census year. While there is no regular discount on gold, the large amount of placer gold sold at an undervaluation renders the average price assumed a probable one. The price for the silver is an estimate of average local rates for the year.

The Outlook.

The immediate outlook for the precious-metal mioes, as a whole, is very encouraging. The great Leadville (Colorado), Eureka (Nevada), Tombstone (Arizona) and Bodie (California) districts are maintaining a steady ou'put, while tbe new Wood River and other districts in Idaho, and a number of recent discoveries in Arizona, hold fortb great promise for the future. In fact, estimates of tbe yield subsequent to the census period indicate an actual and considerable gain."

Final Disposition of the Precious Metals—Coinage.

The receipts of bullion of domestic produotion at the United States assay offices, as previoosly explained, do not indicate the absolute amonnt of the mins outpot, but they serve as a nseful cbeok in many instances. The following tables are abstracts from the oarefully collected statistics of the Treasury Department, selected with reference to their bearing upon the question of production:

Receipts of Gold and Silver of Domestic Production at the Mints and United States Assay Office During the Fiscal Year Ending June 30, 1880.

State or Territory.	Gold.	Silver.	Total.
Alabama	$ 752.79		$ 752 79
Alaska	5 950 90		5 950.90
Arizona	158 019 75	$ 991,823 38	1,150,843 13
California	7,118 816 42	303 846.90	7,422 663 33
Colorado	2,244,069.74	1,257,790.41	3,501,860.15
Dakota	2,750,022.09	21,104.54	2,771,126.63
Georgia	89,831.08	48 73	89,879.81
Idaho	510,540.73	102,999.86	613,540 59
Michigan (Lake Superior)		129,080.94	129 080 94
Montana	1,805 768.00	1,202,982.32	3,008,750.32
Nevada	518,261 35	5 087,242 18	5,605,504.03
New Mexico	91,037.28	424,967 31	516,004.59
North Carolina	85,650.57	379.18	80,038.75
Oregon	583,395.34	1,174.26	584 539.60
South Carolina	11 861.70	15.52	11,877 22

Wells, Fargo & Co. reported the yield of the mines of the Western States and Territories, together with that from British Columbia, to have been $31,369 866 gold, $45,077,829 silver, and $70 947,515 total, for the calendar year 1881.

Receipts of Gold and Silver of Domestic Produotion, etc —Continued.

State or Territory.	Gold.	Silver.	Total.
	Dollars.	Dollars.	Dollars.
Tennessee	1,898.30		1,898.30
Utah	27,029.19	627,703.85	654,733.04
Virginia	9,322.07		9,322.07
Washington	34,529.24		34,529.24
Wyoming	17,320.70		17,320.70
Refined bullion (gold)	18,161,943.52		18,161,943.52
Refined bullion (silver)		2,970 757.02	2,970,757.93
Parted from silver	1 440,524.54		1,449,524.54
Parted from gold		219,337.26	219,387.20
Contained in silver	1,161.47		1 161.47
Contained in gold		2,978.23	2,978.23
Other sources (gold)	144,013.13		144,013.13
Other sources (silver)		18,728,368.15	13,728,308.15
Total	35,822 705.40	32,132 756.95	67 954 462.35

The following tables show the amount of coinage executed during the fiscal year ending June 30, 1880, and the total coinage of the United States up to that date:

Coinage by the United States Mints for the Fiscal Year Ending June 30, 1880.

Metal.	Coinage executed.
Gold	$56,157,735.00
Silver	27,942,437.50
Total coinage and silver coinage	$84,100,172.50
Minor coinage	269,971.50
Total coinage	$84,370,144.00

Total Coinage by the United States Mints from 1793 to Close of Fiscal Year Ending June 30, 1880.

Metal.	Coinage executed.
Gold	$1,133,104,322.00
Silver	292,333,436.90
Total coinage and silver coinage	$1,425,436,758.90
Minor coinage	13 283,167.05
Total coinage	$1,438,719,925.95

Consumption of the Precious Metals in the Arts.

Besides the demand for coinage and export, the precions metals are subjected to a further and constant drain io the large annual consnmption in the arts. Until quite recently it was impossible to ascertain the amount so absorbed with any degree of accuracy, though many attempts were made to this end by officials and statisticians. In 1870, estimates fornished by the large gold-refining houses and manufacturing jewelers showed that probably not less than $9,000,000, and possibly over $13,000,000, of gold were used in the arts during that year. Out of this indefinite sum it was impossible to segregate the proportion of bullion of domestic production so consumed from the United States coin, foreign coin and bollion, and old artioles remelted for manofacturing purposes.

Latterly fuller and more reliable data are available. A systematic investigation, conducted by the Director of the Mint, Hon. Horatio C. Burchard, has resulted in tracing this consumption with great accuracy. Records are now kept at the several mints and United States assay offices of the value of bars made and delivered by them for use in the arts and manufacturing. From these returns, supplemented by individual reports from a large proportion of the manufacturing establishments collected with much care, it is estimated that the amount of gold thus consumed in the United States in the fiscal year ending June 30, 1880, was $10,000,000, and of silver $5,000,000, or $15,000,000 in all. Of this, $5,500,000 gold and $4,000.000 silver were of domestic bullion produced during the year, together with $2,500,000 gold and $600,000 silver United States coin. The remainder consisted of old manufactured artioles and foreign coin remelted,

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Coarse Concentrating Works, Improved Jigs, Crushing Rollers, Sizers, Trommels, Rittenger Tables, and all other adjuncts for the proper working of Gold, Silver and Copper Ores, complete in every detail.

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CORLISS ENGINES from 12x36 Cylinders to 30x60. PLAIN SLIDE VALVES from 6x10 to 30x36. BOILERS of every form, made of Pine Iron Works C. H. No. 1 Flange Iron, or Otis Steel. Workmanship the most careful. All Rivets Hand Driven.

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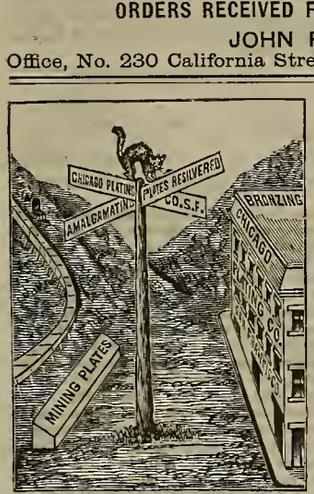

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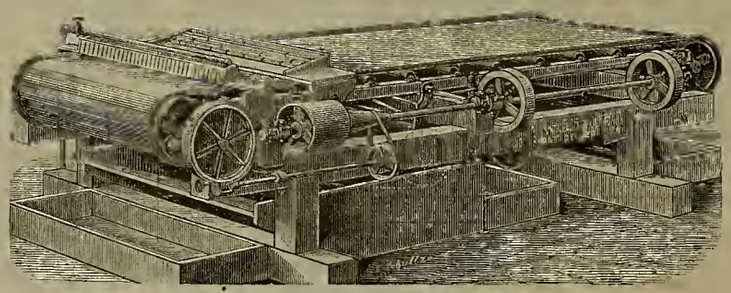

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Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.

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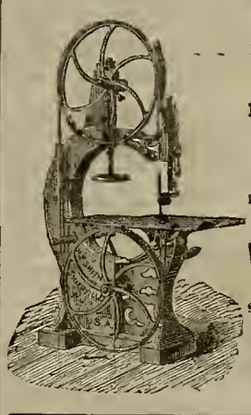

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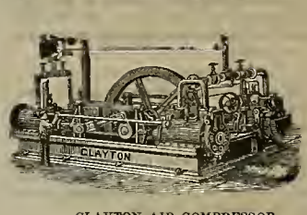

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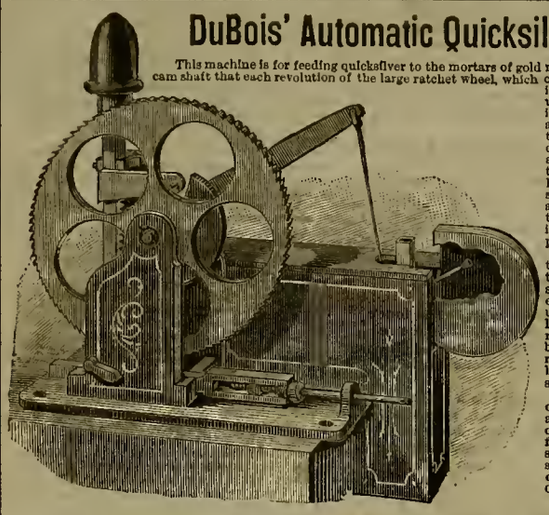
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A chief point of excellence of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; *i. e.*, from every one to four minutes.
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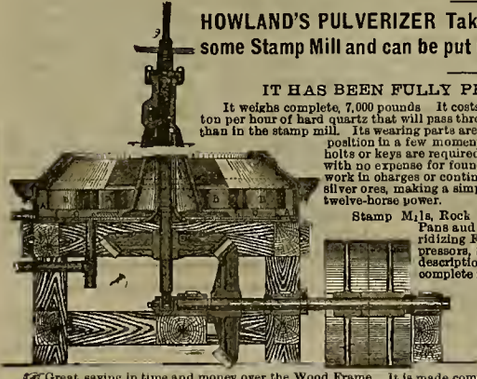
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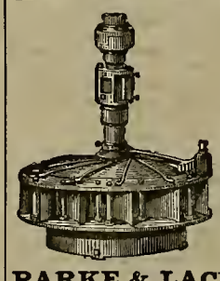
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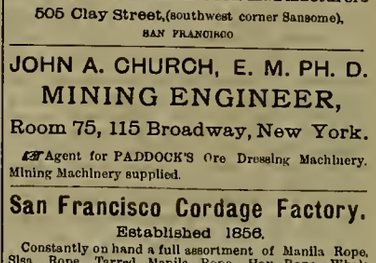
The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
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The Explorers' Miners' and Metallurgists' Companion.
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING MAY 23, 1882.

258,209—VELOCIPEDE—Jos. Ahlert, S. F.
258,276—PICK—Wm. L. Blythe, Mokslumne Hill, Cal.
258,279—DEVICE FOR FORMING SHOULDERS UPON VEHICLE AXLES—Geo. Brammar and J. R. Suarts, Livermors, Cal.
258,286—FRUIT DRIER—Wm. C. Doherty, Albsny, Or.
258,413—JOURNAL BEARING—N. A. Griffith, Austin, Nev.
258,424—DENTAL PLUGGER—Andrew Jackson, S. F.
258,308—RAILWAY CAR—Milton H. Landes, S. F.
258,496—WIND ENGINE—Harry R. Stevens, Los Angeles, Cal.
258,503—ORE FEEDER—I. N. Templeton, Amador, Cal.
258,336—COLLAR BUTTON AND CRAVAT FASTENER—S. M. Williams, S. F.

NOTE.—Copies of U. S. and Foreign Patsnts furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All pstent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

DEVICE FOR FORMING SHOULDERS UPON VEHICLE AXLES.—George Brammar and Jacob R. Swarts, Livermore. No. 258,279. Dated May 23, 1882. This invention relates to an apparatus for cutting off or forming a shoulder upon iron bars, or the ends of the axles of vehicles, when the wheel hoxes have become too short for the length of the spindle, and for other aimilar work. It consists of a clamp or sleeve, having suitable centering and holding screws, the sleeve having a groove around its periphery to receive curved encircling arms, by which a tool-holder is supported and guided while being turned around, so that the tool will make a cut at the desired point and form a corresponding shoulder.

COLLAR BUTTON AND CRAVAT FASTENER—Sylvester M. Williams, S. F., May 23, 1882. No. 258,336. This invention relates to a combined collar button and cravat attachment, and it consists in a peculiarly constructed button having a flat head and a wide, thin shank provided with a hole, said shank being adapted to pass through the button-hole in the shirt, through the holes in the collar, and into a slot or aperture in the back stiffening of the cravat or scarf, and to engage with a peculiar spring upon the other side of the stiffening, whereby it is held in the shirt and the cravat supported. The object of the invention is to provide a ready means for attaching and supporting the cravat to the shirt, and at the same time to fasten the collar.

PICK.—Wm. L. Blythe, Mokelumne Hill, Calaveras county. No. 258,276. Dated May 23, 1882. This invention relates to that class of picks in which the blade and stock are made separate, and it consists in a novel means of securing the blade to the stock or handle whereby it may be easily secured or removed. On the outer or concave surface of the pick-blade is a notch in which fits the strap connecting the blade to the handle. This causes the strap to lie flush with the blade. Keys are wedged in under the back of the blade, and the details of construction are such that the blade and handle are very firmly connected, while at the same time the blade can be readily removed to be sharpened, and another one substituted.

DEVICE FOR COOLING TIRES.—Isaac L. Umstead, Ione, Placer Co. This device is for cooling tires when placed in a highly heated condition on the felly of a wheel; and it consists in a revolving platform or table upon which the wheel is secured, said platform being so journaled or hinged that by the operation of a lever it may be turned from a horizontal to a vertical position, in which position its lower half lies within a tank of water, and the whole platform with its wheel or tire may be revolved therein. By this means fellys of heavy wheels are not charred while buckets of water are being thrown on thick heated tires.

HOFFMANN'S COVER AND BINDER.—This device, made by Joseph Hoffmann, 208 Montgomery street, is especially adapted for binding single magazines and pamphlets in convenient form. When placed in the covers it is like a hook, and when the next magazine arrives the old one can be taken out without injury and a new one substituted, thereby keeping the magazines in perfect order, so they can be bound at the end of the volume if desired, or each number can be retained in the cover and at the end of the year have twelve nice handy volumes, avoiding the two unwieldy hulky volumes which the magazines make, and at about the same expense. With the use of rubber type the name, month and number of the magazine or pamphlet can be printed on the back, making the volume in appearance the same as other hooks placed on the shelves in the library, and always handy for reference. Various styles and sizes are made. All readers will appreciate the convenience of such an arrangement, for the magazine is not only a better form to hold in the hand, but is kept clean and protected from injury.

The Manufacture of Organs.

Until a recent visit to the factory of Bergstrom & Co., on Mission and 29th streets, we had no idea how much of an industry the building of parlor, church and concert organs had come to be in this city. There we found quite an establishment, fully equipped for work of any kind or size, with skilled workmen engaged in the various branches of the art, and all busy, with plenty of work ahead of them. Mr. John Bergstrom began this business in 1864 on a very small scale, and it has gradually grown to its present respectable dimensions. The place is now fitted to make church organs of the very largest size.

Mr. Bergstrom is now making half a dozen organs of a size to take the place of reed organs, as he can sell them at about the same price—say $600—and they have much more volume and make a much more imposing instrument. They will answer admirably for small churches that have no great space, or can afford no very large instrument. One of this type we saw in course of construction.

It is some 13 ft. high by 7 ft. wide, and 4 ft. 6 inches deep. It has pedal bass, with four stops on the manual and 244 pipes. It is quite handsome. There are 25 foot-pedal notes. This type of instrument is a very fine one for large halls, Lodge-rooms, etc.

Mr. Bergstrom is now engaged on a two-manual organ for the Episcopal church, at Seattle, which will cost some $2,000. He is also at work on one for exhibition at the Mechanics' Institute in this city, (which opens in August). This is a three-manual organ, which will cost $2,500. The largest one, on which he is now at work, is a three-manual instrument for St. Francis' Catholic church, on Montgomery Avenue, in this city. This organ will cost $5,000, and it will take to next Christmas to complete it.

Many of the larger organs on this coast have been built by Mr. Bergstrom. That in the Metropolitan Temple in this city, the largest on the coast, was built by him. It cost $12,000, and took 18 months to complete it.

Among others made here was that for the Christian Union at San Lorenzo. One for Guatemala, Central America. The one built for Miss Dillaye, teacher of music and organist of Rev. Mr. Smith's tabernacle, on Tyler street, is a first-class instrument of the type before referred to as designed to displace reed organs.

In addition, organs have been made for the Spanish church in this city; for the Methodist church, Portland, Oregon; for the Methodist church, Santa Clara; for a church in Napa City; for the Independent church (the late Dr. Hamilton's), Oakland; the Presentation convent in this city; for a church in Tucson, Arizona, etc.

They make everything here except the reeds, and no better workmanship will be found in any instrument anywhere. The mechanism is all of first-class order, and every little detail is carefully attended to. They have as good facilities for manufacture as they need, and Mr. Bergstrom is fortunate in having a number of first-class workmen. They use all California woods except in those parts where black walnut is needed.

Mr. Bergstrom has the highest recommendations from all those for whom he has worked, and organists on this coast are indebted to his skill for keeping the instruments in repair. His work is preferred to that from the East, and he has established for himself an enviable reputation for skill, reliability and good work.

News in Brief.

THE bicycle riders of the United States are assembled at Chicago for convention.

IN Cincinnati the microphone is used to detect the leakage of water in the pipes.

THE Philadelphia *Times* says the Knights of Labor number 70,000 in Pennsylvania.

PROF. WM. B. ROGERS, President of the National Academy of Sciences, is dead.

THE strike in the Pittsburg coal mining district, threatens to extend to 1,200 miners.

MARSHAL HENRY, of Washington, estimates that the cost of the Guiteau trial will be $50,000.

IT is believed that Dillon and Davitt have virtually superseded Parnell in the leadership of the Irish party.

THE Mexican Central road has been built 223 miles northward from the capital, and 163 miles southward from Paso del Norte.

THE President has nominated Pay-Inspector Joseph A. Smith to be Chief of the Bureau of provisions and clothing and Pay-master-General of the Navy, with the rank of Commodore.

MINNEAPOLIS is to be lighted by electricity generated by water power at the Falls of St. Anthony, in the heart of the city. A company has been organized, with a capital of $200,000.

THE North American Silk Exchange, recently incorporated in New York, is negotiating for 350 acres on Long Island for a nursery of mulberry trees and for 2,000 acres in Kentucky on which to raise silkworms. The principal supply of eggs has been obtained at Corinth, Miss.

A Home Industry.

The New Buildings of the Mission Soap and Candle Works.

There are but few persons in this city who have anything like a thorough knowledge of the large number of factories which exist and are in constant running order. Some have a faint idea that there is a rolling mill somewhere on the peninsula; that there is a woolen mill at Black Point, and a few other establishments scattered around somewhere, but of the large number of these business enterprises, of the vast capital invested in them, and the thousands of men, women and children to whom they give employment, the large majority know nothing. As a rule, these establishments are as sealed books to the outside world, the proprietors either desiring to keep their business matters to themselves, or, as is generally the case, do not wish the workmen to be annoyed by the incursions of curious people.

Among the leading manufacturing interests of the city the Mission Soap and Candle Works stands at the head. These works are located on Sixteenth street, near Folsom, and occupy a plat of land 200 ft. square. The buildings thereon have just been completed, and were constructed under the superintendence of a gentleman who thoroughly understands the business for which they will be hereafter used. The main building is three stories high, built in the most substantial manner and provided with the necessary elevators and tramways. The property, as well as the business, belongs to Mr. M. Morganthau, a gentleman who has been identified with various manufacturing industries in this State for many years.

In December last the buildings and a great portion of the machinery were destroyed by fire. Mr. Morganthau at once set to work to rebuild and replace the ruined machinery, and, while this was being done, he at once secured an unoccupied factory that was standing idle, and kept on manufacturing his goods to supply the increasing demand, and has never been out of any stock since the fire took place, and now the new works start up more lively than ever, and the fires in the furnaces are kept burning night and day to make up for lost time.

The cost of the new buildings and machinery aggregates $100,000, and nearly $20,000 worth of additional machinery will be placed in position during the next 30 days. The contract for this machinery was given to the firm of William T. Garratt & Co., and, when in running order, the Mission Soap and Candle Works will be the best appointed establishment of the kind on the Pacific coast. The amount paid out monthly for material and labor does not fall short of $25,000. The employees are all white people, among the number being some 20 boys and girls. The work for the latter is light and easy, and many of the girls are very expert in handling, stamping and packing the product of the establishment. The boxes alone in which candles are packed cost from $7,000 to $8,000 annually, and, as the business is rapidly increasing, the expense account will increase in like ratio. The works manufacture the following brands of Candles, viz: Chemical Wax, Solar Sperm, Adamantine, Light Weight, Coach and Hotel Candles, and the following brands of Soap viz: Chemical Olive, Extra Family Nonpareil and White Castile Soaps, and these brands are well known all over the coast. "The Chemical Wax" is a favorite through all the mining regions of California and Nevada, and the Sperm, Adamantine, Coach and Hotel Candles are recognized as a standard with the trade.

Adjoining the main building is a large, solid wooden structure, devoted exclusively to the manufacture of soap. When our reporter called, three immense vats running from the top story, funnel-shaped, to the lower floor, were filled with boiling soap. Each vat contained 30,000 lbs. The machinery in this department is of the latest style, and all brands and styles of laundry and toilet soap are manufactured, stamped, wrapped, boxed, marked and ready for delivery.

These works were established in 1870, and, since that time, all the Government contracts for candles and soap for the Department of California have been filled by them. The general excellence of the goods fully sustains the reputation of the works. For the past 12 years over 1,000 families in San Francisco have used the Mission Extra Family Soap, and the demand is constantly increasing. The enterprise of the proprietor and his hostility to the employment of Chinese labor is sufficient to prophesy for him a successful business career in his conduct of the Mission Soap and Candle Works.

The above sketch will no doubt interest many of our readers, and those who believe in patronizing home industry can have the opportunity by calling for Mr. Morganthau's goods. He claims that his manufactures are superior to Eastern makes and no higher in price. He rightly thinks he should be supported by the people of the Pacific coast, because he spends his money here, while money paid for Eastern soap goes to build up Eastern industries instead of our own. The account above shows that Mr. Morganthau has much enterprise in his business, and he should be encouraged.

Cylinder Printing Press for Sale.

A large cylinder Hoe printing press, for country newspaper work, can be bought cheap by addressing
, Press, Box 2361, S. F.

Back Numbers Wanted.

We will pay 10 cents a copy for the following numbers of the MINING AND SCIENTIFIC PRESS: Volume, 13; year, 1866; number, 1. Volume, 18; year, 1869; number, 5. Volume, 20; year, 1870; numbers, 1 and 26. Volume, 22; year, 1871; number, 1. Volume, 30; year, 1875; numbers, 2, 3, 4, 7, 10, 11, 12, 13 and 15.
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MESSRS. DEWEY & CO., Patent Agents:—The Canadian patent obtained through you is at hand. This makes three patents received within a month. The ability, energy and promptness displayed by your firm must certainly be gratifying to your numerous patrons—as it assuredly is to
Yours respectfully,
THORPE & BELLOLI.

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Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired), be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

Laurel Glen Fruit Farm.

This place is beautifully located among the hills. A pleasant drive from railroad and beach. Deer and other game abound in the vicinity. A limited number of boarders can be accommodated for the summer and hunting season. The place is especially desirable for ladies with children. Address, for further information, Isaac Dakin, Soquel, Santa Cruz county.

A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

PERSONS receiving a sample copy of this MINING AND SCIENTIFIC PRESS *with this notice marked*, are requested to examine the merits of the same, and consider fairly its claims for support, and if consistent, subscribe for the paper through the P. M. or agent delivering it, or otherwise. We shall send it, on trial, at the rate of $4 per annum for any period the reader may wish. Please notice our terms elsewhere, and if desired, send for further samples and information. Those who can circulate this No. further to our advantage are invited to do so.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F. D., at this office.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

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CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M. daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

HOW TO STOP THIS PAPER.—It is not a difficult task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

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Mining and Other Companies.

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Guadalupe Silver Mining Company—Location of principal place of business, San Francisco, California. Location of Works, Urique, State of Chihuahua, Mexico.

Notice is hereby given that at a meeting of the Board of Directors, held on the 28th day of April, 1882, an assessment (No. 28) of Fifty dollars ($50) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 109 California street, Room No. 13, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the fifth day of June, 1882, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the third (3d) day of July, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. WM. BLACKWOOD, Secretary.

Office—No. 109 California street, Room No. 13, San Francisco, Cal.

ASSESSMENT NOTICE.

Gould & Curry Silver Mining Company.

ASSESSMENT, NO. 42.

Levied	May 23, 1882
Delinquent	June 29, 1882
Day of Sale	July 20, 1882
Amount per Share	Fifty Cents per Share

ALFRED K. DURBROW, Secretary.

Office—Room 20, Nevada Block, 309 Montgomery St.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company.

San Francisco, May 25, 1882.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 7, of ten cents (10c.) per share, was declared payable on Monday, June 12, 1882. Transfer Books closed on Friday, June 2, 1882, at three o'clock P. M. This dividend is payable at the Farmers' Loan and Trust Company, in New York, on all stock issued there, and at the office in this city on all stock issued here. WM. WILLIS, Secretary.

Office—Room 29 Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

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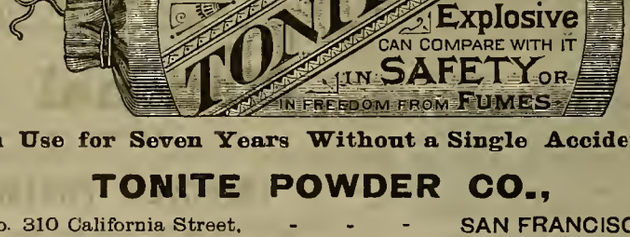

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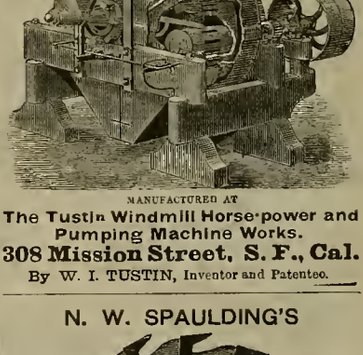

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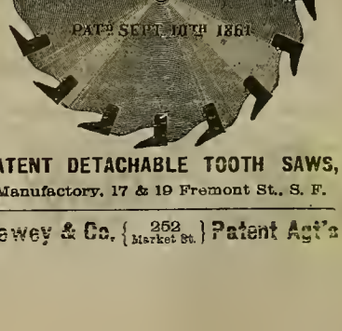

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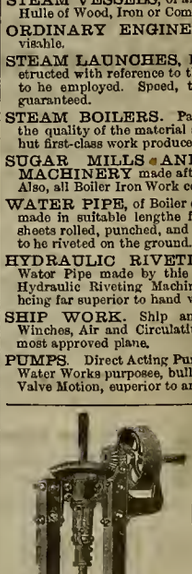
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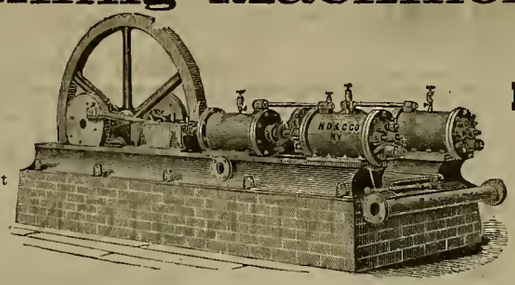

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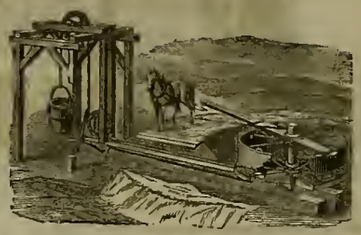

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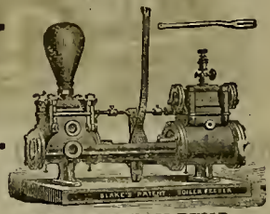

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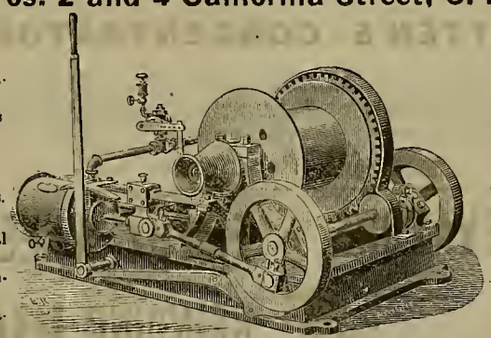

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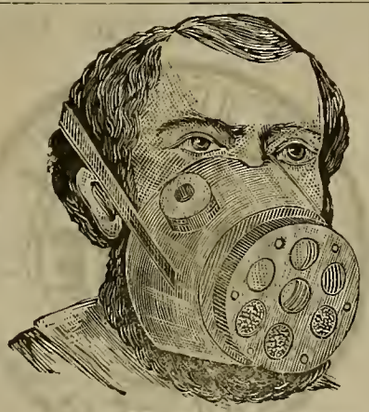

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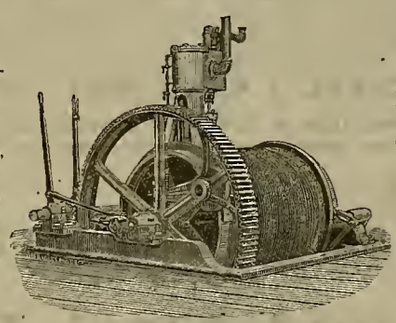

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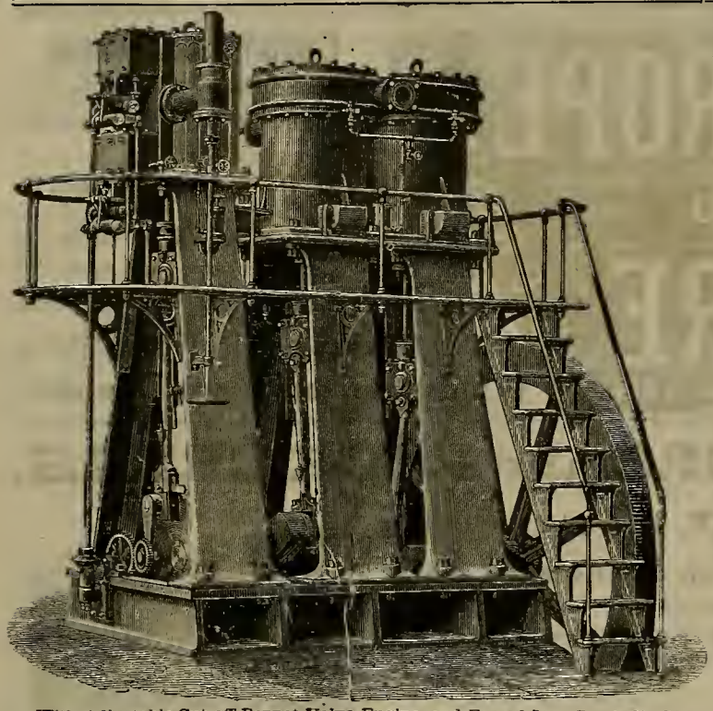

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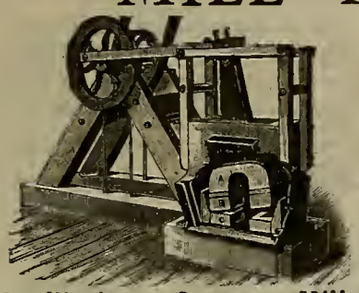

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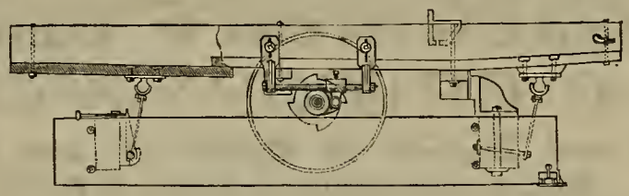

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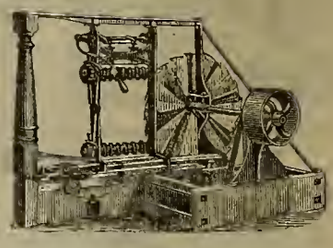

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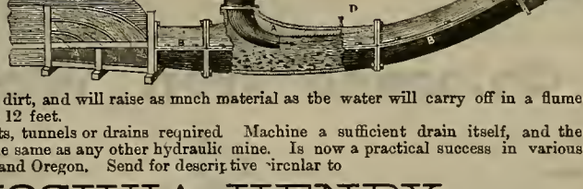

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MINING AND SCIENTIFIC PRESS.

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Generation of Chlorine.

In answer to an inquiry, and for the general information of those desiring to know the method of production of chlorine gas for chlorination process, we take from Kustel's "Roasting of Gold and Silver Ores" (for sale by Dewey & Co.), a description of the generating apparatus. The gas is produced in a leaden vessel, as shown in the engraving.

The circular tub, *a*, has on the outside a circular ring, *b*, two and a half inches deep and two inches wide, for the reception of the flanges of the cover, *c*. The cover is provided with a center hole for the reception of the stirrer, *d*, with a leaden pipe, *e*, bent in the shape of the letter ∞, through which the sulphuric acid is introduced; another pipe, *f*, conveys the gas to the washing apparatus, *g*. At the bottom of the gas generator is an opening, *h*, for the discharge of the residue, and *k* serves for introducing the charge.

The cover is placed over the generator, the edge of the flange luted with clay, as shown by *m*, all round, and then filled with water, as indicated by the dotted line. The space at *n*, round the stem of the stirrer, must be filled with packing of cotton cloth strips saturated with oil, and the outlet, *h*, closed with a wooden plug wrapped like the stuff-box in cotton cloth, also saturated with oil, and the space between collar and plug luted with clay, or better, with putty. The stirrer rests on a glass button, inserted in the cavity of the lead socket. Mr. E. Riotti has discovered that oil, in contact with chlorine, forms a sticky substance, which prevents the chlorine from penetrating it; and the india-rubber hose, if oiled inside before use, retains its flexibility, especially if the oiling is repeated from time to time. It is thus very easy to stop the escape of chlorine gas wherever leakage is observed, by applying some suitable material, impregnated with oil. It would also give an excellent coating, a substitute for pitch or asphaltum, if the chlorination vats were coated two or three times with warm oil, which enters readily the pores of the lumber much deeper than asphaltum varnish.

All roasted sulphurets do not consume the same amount of chlorine gas. The following approximative charge may serve to chloridize three tons:

30 lbs. of manganese (peroxide) pulverized, 30 to 40 lbs. of common salt, according to quality, 75 lbs. of sulphuric acid of 66° B., and 45 lbs. of water; or, 30 lbs. of manganese, 30 lbs. of salt, good quality, 85 lbs. of sulphuric acid 63° B., and 35 lbs. of water.

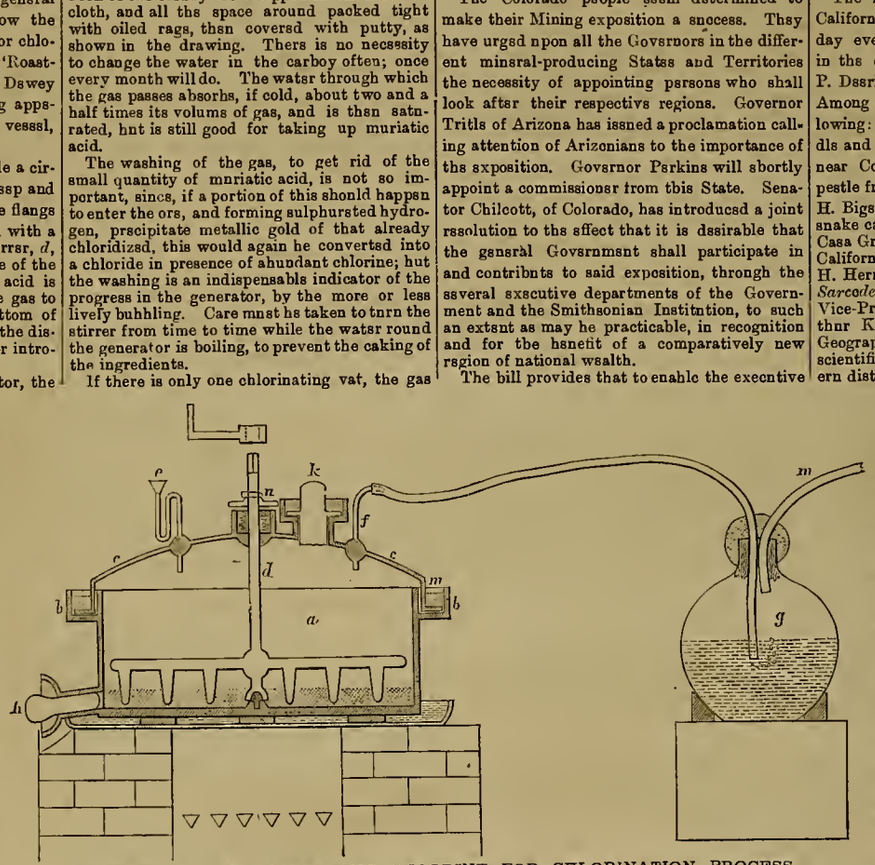
Sulphuric acid of 66° costs four cents per pound in carboys, and the same of 63°, two and a half cents; the latter charge, therefore, is cheaper, unless the freight would exceed seven cents per pound.

Water, salt and manganese are first introduced, and the charge-hole, *k*, closed with a wrapped solid plug of lead, as above described, and luted with clay. The generator is placed in a square piece of boiler iron, the edges of which are bent up two or three inches, to hold water or prepared for steam. The sulphuric acid is now introduced through the pipe, *e*, but not the whole amount at once; about 12 lbs. to begin with will answer to create sufficient heat to develop the gas, which escapes through *f* into the carboy, *g*, to be washed from acids. The gas should bubble through the water very lively; if not, the stirrer should be turned, and if this fails to produce the required effect, more sulphuric acid must be introduced and repeated as often as the bubbling appears to become less active, always using the stirrer first. After all the sulphuric acid has been used up, the fire must be started till the water below the generator commences to boil. It takes about four hours to develop all the chlorine gas.

The rubber hose from the pipe, *f* (three-fourth inch hose), after being oiled inside, is inserted into the carboy one or two inches below the water; the other hose, *m*, conveys the gas to the chlorinating vat. Both rubber pipes in the neck of the carboy are wrapped in oiled cotton cloth, and all the space around packed tight with oiled rags, then covered with putty, as shown in the drawing. There is no necessity to change the water in the carboy often; once every month will do. The water through which the gas passes absorbs, if cold, about two and a half times its volume of gas, and is then saturated, but is still good for taking up muriatic acid.

The washing of the gas, to get rid of the small quantity of muriatic acid, is not so important, since, if a portion of this should happen to enter the ore, and forming sulphuretted hydrogen, precipitate metallic gold of that already chloridized, this would again be converted into a chloride in presence of abundant chlorine; but the washing is an indispensable indicator of the progress in the generator, by the more or less lively bubbling. Care must be taken to turn the stirrer from time to time while the water round the generator is boiling, to prevent the caking of the ingredients.

If there is only one chlorinating vat, the gas from the carboy can be conveyed through one hose direct into the vat below the filtering bottom; but if there are several of these, it is better to fix a lead (three-fourth inch) along the vats, connected with those half-inch pipes before each vat, to which a piece of hose is attached. If not in use, the hose is withdrawn from under the filter and closed with a stopper.



APPARATUS FOR GENERATING CHLORINE FOR CHLORINATION PROCESS.

Classification of Mining Exhibits.

The directors of the Denver Mining exposition have adopted the following classification for exhibits directly relating to mining:

Department A, Mineralogy.—Class 1, gold ores; class 2, silver ores; class 3, iron ores; class 4, lead ores; class 5, copper ores; class 7, bituminous coals; class 8, anthracite coals; class 9, cannel coal; class 10, lignite; class 11, other metalliferous specimens not enumerated above.

Department B, Geology.—Class 1, marbles; class 2, lithographic stone; class 3, limestone; class 4, miscellaneous building stone; class 5, fossils; class 6, gypsum; class 7, precious stones and crystals; class 8, native chemicals.

Department C, Metallurgical Machinery.—Class 1. Reverberatory roasting furnaces, blast and reverberatory smelting furnaces, cupel, retort and other furnaces for separating base precious metals.

Class 2. Stamp mills for free gold ores, stamp mills for free silver ores, stamp mills for dry crushing, and furnaces for roasting refractory gold or silver ores.

Class 3. Pans and settlers for amalgamation, leaching vats for leaching process, concentrators for crude ore or tailings.

Class 4. Other devices not included in the above classification.

The Denver Mining Exposition.

The Colorado people seem determined to make their Mining exposition a success. They have urged upon all the Governors in the different mineral-producing States and Territories the necessity of appointing persons who shall look after their respective regions. Governor Tritle of Arizona has issued a proclamation calling attention of Arizonians to the importance of the exposition. Governor Perkins will shortly appoint a commissioner from this State. Senator Chilcott, of Colorado, has introduced a joint resolution to the effect that it is desirable that the general Government shall participate in and contribute to said exposition, through the several executive departments of the Government and the Smithsonian Institution, to such an extent as may be practicable, in recognition and for the benefit of a comparatively new region of national wealth.

The bill provides that to enable the executive departments and the Smithsonian Institution to participate in the exposition, they are authorized to send such maps, reports, publications, models, plans, devices, specimens, implements, products, fabrics, instruments and other articles in their possession as may (in the judgment of the heads of the several executive departments and the Secretary of the Smithsonian Institution, or subordinates severally designated by them, who are constituted a board for such purpose, of which board the Secretary of the Interior shall be chairman) be of interest or value within the scope of the exposition, the same to be transported to, cared for and returned from the exposition at the cost of the Government, and for the expense of which (including necessary preparation) the sum of $20,000, or so much thereof as may be necessary, is appropriated, the same to be immediately available, from any moneys in the Treasury not otherwise appropriated, to meet all the expenditures incurred in making such Government exhibit. That board provided shall have authority to appoint a superintendent to have general charge of all articles contributed by the Government, and also a secretary and a disbursing officer, at such a compensation to each as may be deemed just, not, however, in excess of $3,000 per annum.

The exposition opens August 1st, and closes Sept. 30th. It is by no means exclusively for mining exhibits, they only being made the more prominent features. California has been ransacked for specimens so thoroughly that it will take a good, live man and considerable canvassing to get up a respectable show from the State. If we are to do anything at all, some one ought to be at work as soon as possible.

MEXICO has taken a great step in advance by abolishing the custom house lines between the States of the republic.

Academy of Sciences.

The regular semi-monthly meeting of the California Academy of Sciences was held Monday evening last, Vice-President J. P. Moore in the chair. A. H. Brocksenfeldt and Frank P. Dearing were proposed as resident members. Among donations to the museum were the following: From Dr. Slocum, a stone whirl-spindle and a human skull from an Indian grave near Corinne; from B. B. Redding, a stone pestle from a mound near Salt Lake; from H. H. Bigelow, a stone incense cup with a rattlesnake carved in bas-relief around it, dug up at Casa Grande, Arizona; from B. C. Truman, a California flying fish from Monterey; from Dr. H. Herman Behr, three red snow plants called *Sarcodes sanguinia*, from the Sierra Nevada. Vice-President Moore read a paper by Dr. Arthur Krause, Ph. D., member of the Bremen Geographical Society, suggested by his recent scientific explorations in Alaska, in the southern district of which he spent the past winter, with his brother, among the Indians, collecting information. He said southern Alaska resembled the south-west coast of Norway in its minerals and fisheries, where thousands of pleasure seekers resort annually to enjoy the natural beauty of the scenery. He pronounced Alaska far more valuable than Norway in this and in most respects. He predicted the gradual extinction of the 10,000 or so Indians now in the Territory, especially should the newly discovered gold mines prove as valuable as now anticipated. Some tribes of the coast Indians differ entirely in their language and features from their neighbors. The Chilcat and Chilcoot Indians have monopolized trade with the interior, and are very anxious to keep whites traders and other tribes from encroaching on their direct trade between the coast and the Nomadic Indians at the headwaters of the Yukon river. These they reach in three days by the eastern route across the country, by river branches and lakes, with short land portages. The western route takes seven days, and passes are easy. Both routes unite near the Hudson Bay company's abandoned Fort Selkirk, which was destroyed by an expedition of Chilcat Indians. The Chilcats travel by the western and the Chilcoots by the eastern route, and this division is observed under penalty of war. They never use sleds or dogs, but pack their own burdens, using snow-shoes, and have to cross one glacier. Tobacco and blankets are largely dealt in, and they communicate with trading stations from 600 to 1,800 miles up the Yukon.

Mr. Moore described parasitical plants, especially the *Arcuthobium*, a mistletoe that grows on the digger-pine and all junipers, and spreads its glutinous seeds by explosions, through which they are projected and stick over birds, who thus distribute them. The red snow-plant was first discovered in Siberia 40 years ago, and has only been found on this continent among the Sierra Nevadas.

Dr. C. C. Parry, of the U. S. Bureau of Forestry, described his recent trip through Lower California, where he found new specimens of the flowering ash, evergreen oak, two species of horse-chestnuts, a new and very delicate fine-foliage rose, new ferns, only found in Florida and the Hawaiian islands, and a cactus, valuable for manufacturing purposes, that secretes a hard gum, which, mixed with alcohol, makes a fine varnish, and is useful for painting pottery.

BLANKETS VS. PLATES.—Cheasbro is mining on Snake river, near Mundy's Ferry. He has discarded the silver plates at first used, and blankets are now employed to catch the gold. No clean-up has as yet been made, but it is thought that the ground will pay very well. There is an immense tract of land in that locality, which, if it pays well enough, will be an important addition to the mining of Idaho.—*Idaho World.*

The Maginnis District.

A Most Excellent Country to Stay Away From.

Capt. E. A. Nichols returnsd last night from a trip to northsrn Montana. He bas been gons about a montb, had a very rough trip and is glad to get back to Bntte. He was buttonholsd by an *Inter-Mountain* rsporter tbis morning, and asksd to givs an opinion abont the socallsd Maginnis mines.

"The country is too new," said tbe captain, "to warrant me in hazarding any positive statements relating to tbe pressnt ontlook for the Maginnis conntry, bnt I sbould cstrainly advise none of my friends to go there."

"What are ths principal characteristics of tbs ledgss?"

"The most noticeable feature is their soarcity, and nsxt to tbat is their narrowness. What mines have hssn discovered are located in a gnlob on a big mountain some distance north of the Snowy rangs. Soms of tbe veins sbow good-looking carbonate and galena ores, and some little copper has bssn found, hut the ledges are very narrow and irregular. The two leading minss are tbe Chollar and a property recently pnrcbassd hy Hauser and Holter. The Cbollar is a good-looking prospect. It is yielding some rich ore, hut Haussr's mine is closed down and no one knows anything about it. Some say that it contains nothing, and nthsrs tbat it is a bonanza. You can hear anything you want to about it."

"How many men are in that country?"

"Batwssn 300 and 400. They are nearly all prospectors, with tbe exception of a fsw who work in the Chollar. Thsre ars tbres towns in the gnlch—Maidenville, Georgetown and Andersonvills. Tbe first named is the most important, bnt its bnsiness and popnlation have been grossly exaggerated."

"What did you bear about tbs Barker district?"

"Notbing very enconraging, thongh ths expenditure of capital will undonbtedly result in the development of paying mines in that locality. At present, however, tbe smelter is closed down, and the ledge which has been supplying it is not over 10 or 12 inches wide, if reports may be relied upon. I did not go tbere."

"Did you explore the wonders of tbe Clark's Fork country?"

"No. I am not an expsrt on snow-sboes, and I bave bad all the winter I want in Montana this year. It ie yet a month too soon to attempt to proepeot the Clark's Fork district. Tbere are a few promising locations there and some extent of placer ground, but the latter—like the few placer claims in the Maginnis country—can he worked only for a limited time esch year, owing to the scarcity of water. If the Maiden placers could be worked six months eteadily, tbat would be the last of them. Quartz will he the mainstay of the country in the way of mining, but I think northern Montana is far richer in agricultural and etock-raising resources than in mineral wealtb. There is room and opportunity in all the northern counties for thousands of happy bomes, bnt no intelligent prospector can afford to leave the counties of Silver Bow, Madison, Jefferson and Beaverhead in searcb of bidden treasures. We bave more right here in the Summit Valley district tban all tbe rest of Montana contains.

A Rich Oil Region.—The combination which embraces Charles N. Felton and Messrs. Scofield & Tevie are engaged just now in spending some $300,000 in developing the Pico oil district. They are now sinking eome 15 new wells, and we will jnst whisper, as a secret, not to be divulged ligbtly, tbat the company bas lately struck a stream of oil, in a new well, which anewers to tbe "flow of Iser rolling rapidly," to employ the language of the poet. To get down to tbe prosaic reality, the enterprising capitalists who have the oil qnestion in band in Los Angelee county bave struck it rich. They believe tbat, when the Pennsylvania oil field bas been exhausted, they will stsnd in the bresch and give the whole world and the rest of mankind all tbe petroleum they need. And we are heartily glad of it, firstly becanse it will give Los Angeles county an eminence independent of her orange groves and vineyards, and secondly because tbe whole enterprising band who bave developsd this local interest are whole-souled and thorough-paced gentlemen, who took hig chances and poured ont their money like water before a phenomenal success rewarded tbeir efforts.—*Los Angeles Herald.*

A Pioneer Steamer.—The steamship *Senator*, which is as old as the State, is being changed into a barge. Tbe veseel was built in 1848, in New York, and was hrongbt to this coast in 1849. Before the sliokens filled up the Sacramento river ebe made regular trips to Sacramento, and there is bardly a miner in the State who has not traveled on her. In later years she has been employed in the coasting trade, rnnning to all ports from San Diego to Victoria. The vessel has been tbe most profitable piece of property which ever floated on the waters of the bay, and has earned several fortunes for ber owners.

A simple precaution, costing neither money nor labor, ie said to increase the durability nf posts put in the ground hy 50%. This ie simply hy taking care that the wood is inverted, *i.* e., placed in the opposite direction to tbat in which it grew.

The Wood River minss are making some heavy sbipments of high-grade ore to Salt Lake,

Mining by Cheap Methods.

The Forest City *Tribune* bas, undsr ths above beading, some remarks abont mining in Sierra conuty that apply eqnally well to othsr counties. The *Tribune* says: Tbsrs are many qnartz lsdges now lying idle and partially or wholly undevsloped, beoanse of tbe idea so prevalent among minsrs that it is nscessary to work on a grand scale. They think they ars not mining nnlsss they have a 20-stamp mill, a big lsdgs and a beavy force of men. The constant cry is capital, more capital. While cspital is necsssary for working dsep minss, low-grade ore, running long tunnels, etc., yet thers are many ledges in this connty owned by poor men, and beld by tbem with tbe bops of working thsm in the fnture, which nugbt to be prospected and worked down at lsast to the depth of 200 ft. without any great outlay of money, and the rock from wbich could be crusbed in arastras, or hy otber cbsapsr metbods than suob as involve an expensive mill and machinsry.

Nothing conducss mors to ths general prosperity of any section of country than an abundance of laboring msn wbo ars working tbemselves. The flush times of California in early days wers caused by tbe fact that men could mins for tbemselvss witbont any previons outlay of money. A pick and pan wers all that was nscessary.

What is nesded now in California is a method of reducing ore at the rate of, say, one ton in 12 bours, the expenss of wbich wonld be witbin the reacb of a poor man. Tbe good old-fashioned arastra appears to be completely forgottsn. A borse power could be so attacbsd to one or two ligbt stamps as tn crnsb tbat amount of ore, and yet tbs expense shonld not exceed a few hundred dollars. We know of a ledge that has yielded $15,000, all of wbich has been worksd in a nne-stamp mill that cost but $600. And we are acqnainted with a mins, tbe ore from whicb is all crushed in an arastra, which did not cost tbat muob, and wbicb is yielding good returns to its nwners.

Grows on the Bushes.—That Plumas is one of the leading mining counties of tbe State tbere is no chance to doubt, and tbat tbe natnral resources of the county are far ahead of any other is another certainty; but we never knew nntil a few days ago that gold grows on tbe busbes. Sucb, however, ie the case. Onr old friend, Jim Lafoon, in a little talk we held with bim, states that, while working hie claim on Smith's hill, some years ago, one of his partners fonnd a nugget weigbing an onnce or more, in the forke of a little oak sappling some incbes above tbe surface of the ground. He accounts for it with the tbeory that the husb forked nnder the ground and grew around tbe nugget, and tbat later the dirt was washed from aronnd it, leaving it exposed. We are inclined to the belief, however, that tbe eoil in tbat locality is eo rich that it impregnated the oak, and it blossomed and bore frnit in the sbape of the nugget. Probably we sball rnn against the ideas of eome of the old geological fossils who infest tbis region occasionally, bnt it can't be helped. Gold grows on tbe Plumas husbes, and tbey don't want to forget it.—*Plumas National.*

Consumption of Boxes.—It looks, says tbe Reno *Gazette*, as if tbe consumption of boxee on the Pacific coast wonld continne to increase and the mannfacture of them become one of tbe greatest induetriee in the conntry. Tbere is already a vast amonnt of packing going on, and it mnst increase rapidly for many years, for the resonrces of the coast are not one-tenth part developed. The whole East ie open to tbe California prndncer nf grapes, apples, peare and small frnits, while the whole world is drawing on ber for salmon, canned goods, horax and other staples. Nevada, Utah, Colorado, Wyoming, Arizona, New Mexico and Texas send for greene and vegetables every day in tbe year nearly, and they all bave to be boxed. All this time great vineyards are being planted to grapes, the foothille are being cleared and orcharde set ont, the rivere are being stocked with salmon and trout, borax beds are being opened up in Nevada, soda ie being sbipped to San Francisoo by tbe car-load, to be refined and canned, the sugar trade is growing, manufactnres are increasing, and they are all shipped in wood. The outlook is a grand one, and it should stimulate the manufacturers to make preparations for working cheaply and to advantage. The present way of turning ont boxes is very extravagant.

At the quarterly meeting of tbe Directors of the Richmond Con., held at London, May 3d, the nenal dividend was declared. The acoounts for the year ending Feb. 28tb show a balance of nndivided profits, including reserve fund of over £100,000. The usual telegram from the mine statee tbat the week'e run was $22,000, from 438 tons of ore, with one furnace. During the week tbe refinery produced Dore bars to the value of $23,000.

Andrew F. White, coiner of tbe San Francisco mint, has finished the May statement of coinage, as follows: Double eagles, $1,060,000; eagles, $330,000; balf eaglss, $240,000; silver dollars, $950,000; total, $2,580,000.

Work is progressing steadily in the mines at Downeyville, and ore of a good grade is being extracted.

Announcement Extraordinary.

We lately notiosd the following good tbing at L. Sage's Congress Springs Hotsl, Santa Clara oonnty. It is creditable, no doubt, jointly to "Mark Twain" and "actual facts and occurrsnoes in hotel experience." We givs it for the interest of all concsrned.

SPECIAL NOTICE.

This hotel bas been built and arranged for the special comfort and convenience of summer boarders. On-sr rival each guest will be asked how he likes the situation; and, if he says the hotel ought to have been placed up upon the knoll or further down toward the village, the location of the house will be immediately changed. Corner front rooms, up only one flight, for every guest. Baths, gas, hot and cold water, laundry, telegraph, restaurant, fire alarm, bar-room, billiard table, daily papers, *coupe*, sewing machine, grand piano, and all other modern conveniences in every room. Meals every minute, if desired, and, consequently, no eecond table. English, French and German dictionaries furnished every guest, to make up such a bill of fare as he may desire, without regard to the bill-affair afterward at the office. Waiters of any nationality and color desired. Every waiter furnished with a libretto, button-hole bouquet, full-dress suits, ball-tablets, and bis hair parted in the middle. Every guest will have the best seat in the dining-hall and the best waiter in the house. Any guest not getting his breakfast red-hot, or experiencing a delay of 16 seconds after giving his order for dinner, will please mention the fact at the office, and the cooks and waiters will be blown from the mouth of a cannon in front of tbe hotel at once. Children will be welcomed with delight, and are requested to bring hoop-sticks and haw-keys to hang the carved rosewood furniture especially provided for that purpose, and peg-tops to spin on the velvet carpets; they will be allowed to hang on the piano at all hours, yell in the ball, slide down the bannisters, fall down stairs, carry away dessert enough for a small family in their pockets at dinner, and make themselves as disagreeable as the fondest mother can desire. Washing allowed in rooms, and ladies giving an order to "Put me on a flat iron" will be put on one at any hour of tbe day or nigbt. A discreet waiter, who belongs to the Masons, Odd Fellows, Knights of Pythias, and who was never known to even tell the time of day, has been employed to carry milk punches and hot toddies to ladies' rooms in tbe evening. Every lady will be considered tbe belle of the house. The office clerk has been carefully selected to please everybody, and can play draw poker, match worsteds at the village store, shake for the drinks at any hour, day or night, play billiards, good waltzer, and can dance the Germau, make a fourth at enchre, amuse children, is a good judge of horses, as a railway and steamboat reference is far superior to Appleton's or anyhody else's guide, will flirt with any young lady, and not mind being cut dead when "pa comes down;" can room 40 people in the best room in the house when the hotel is full, attend to the annunciator, and answer questions in Hebrew, Greek, Choctaw, Irish, or any other polite language at tbe same moment without turning a hair. Dogs allowed in any room in the house, including the w(h)ine room. The proprietor will always be happy to hear that some other hotel is "tbe best in the country." Special attention to parties who can give information as to "how these things are done in Yewrup." The livery connected with the establishment is complete in all its details. Our horses all can trot to the wire in 2:15 and less. Pedigrees furnished, carriages and vehicles with coat of arms and heraldic devices of all descriptions and to suit the most fastidious. Footmen and drivers uniformed and can converse on any subject, a classical education being made a condition of service. The proprietor will take it as a personal affront if any guest on leaving should fail to dispute his bill, tell him he is a swindler, the house a barn, the table wretched, the wines vile, and that he, the guest, "was never so imposed upon in his life, will never etop there again, and means to warn his friends."

The Nevada Fish Hatchery.—A Reno *Gazette* reporter recently visited tbe State fish nest, corner of Second and Nevada streets, Carson City, wbere Fish Commissioner Parker carries nn the good work whicb he organized. The eggs do not bave to be eet on, exactly, but great care is required to bring out the little fish. He bae three trongbs, 18 ft. long, 16 incbes wide, and 10 inches deep, coated with aspbaltnm and coal tar, tbrongh whiob runs a stream of fresh, cold water. One trough now contains 10,000 young salmon from the McCloud river, whicb will be turned loose in the Truckee sbortly. Tbe other two contain 50,000 New Eugland brook trout, about one inch long, hatched from eggs giveu to the State by Capt. J. B. Overton. They will be distributed tbrougbont tbe State. Mr. Parker bae an appropriation of $2,000 from tbe State. He bae carried on the work for the love of it, without any personal recompense. The State'e money has gone to bnild a canvas boat, seines, cans, build troughs and pay a man a small salary during tbe batcbing period and for distribnting. In a small aquarinm in bis house he has some pets that came a long way. They are land-locked salmon and play around like canary birds. Once in a while one leaps clear over the side. He got 10,000 eggs and only lost one-balf of one per cent., which shows scientific natcbing.

Buying Ore.—A letter from the town of Luning, on the Carson & Colorado railroad (Nevada), says: Prospecting parties are coming in every day with sacke of samples of ore for assay at the office of J. C. White, wbo ie the agent of tbe Melrose Smelting Works. of Oakland, and buys all tbe ore that is offered for sale. By this means a single man or small party of men get qnick returns for any prodnction made, and are tbue enabled to continne their developments to a greater extent, and at a faster speed, tban has ever been tbe case in southwestern Nevada.

A Notable Steel Chain.—There has lately been made at Hull, England, a chain of Siemens steel; 180 yards long, containing more tban 3,200 links, held together hy about 850 steel pins. It ia intended for lifting purposes, bas an estimated strength of 60 tons, and is tbought to be the largest cbain of its kind ever made.

By the arrival of the steamer *Otter*, from Fort Wrangle and way porte, news is received that the Sticksen river is open. The fisheries on the Naas and Skeena rivers had commenced operations, and the rnn of fish is fully up to the average for this time of the year.

Mining in Sonora.

Extent and Richnese of the Ariepe Dietrict.

Ths Sonora valley is becoming tboroughly Americanized, and nearly all the fancy mineral deposits ars gradually falling into tbs hands nf the sbrewd Yankses. Ths Arispe district, whiob has a world-wide fame for the extant and richness of its mineral deposits, has now an American popnlation nearly equal to the nativss of tbe soil. Those foreigners on the Sonora soil are neither drones or drnnkards, but hard working, intelligent men, whose presencs represents untold wsalth to any country. Tbsy are nsarly all sngaged in mining snterprises, tbongh a few have branched off into mercantile pursuits, the pressnce of so many foreigners guarantssing a respectable portion of trade.

The principal mineral bed of Sonora yet discovered is sitnated about 25 miles soutb-east of Arispe. This is tbe great Mecca of the American prospector and mining man. Here comss tbs weary prospector and his patient burro, the snterprising capitalist and bard-fistsd day lahorer, all ssger to engags in tbe pursuit most congsnial to his tastes.

From Mr. D. T. Dunbam, who arrived bers on Sunday evening from Sinaquipo, Sonora, we lsarn that several Amsricsn companies ars working mines in tbat vicinity. Mr. Dunbam is a stockholder in tbe Santa Maria Gold and Silver mining company, a cornoration baving headquarters at 39 Broadway, New York. This oompany is working nine mines, and has ordered and paid $200,000 for a 60-stamp mill that will be in opsration in less tban six montbs. The principal mines of this gronp are the Santa Maria. Carmsn, San Francisco and Granadita. The Carmen bas besn worked for more than 200 years, and is a grand mineral bed. It was abandoned by the original owners about 10 yesrs ago ou account of Indian troubles, and lay in a dormsnt state until resurrscted by the pressnt proprietors a fsw years ago. It was in a horrible state when the company bsgan to work it. Filth, mud and water abounded, and it took the present owners nearly a year to clean it out. It is now opened up in good working condition, so that a hundred tons of ore can he extracted daily. The nine mines owned by the company are situated in a group within a radius of a mile, and nnt more tban six miles directly to the Sonora river, where tbe mill will be erected. A first-class wagon road bas been graded from the mines to the mill, and everytbing is in readiness to etart as soon as tbe contractors have the mill ready for action.

Barrajita, a station on the Sonora railroad, is 85 miles west of the mill site, and a good wagon road is now being bnilt by tbe company between the two places. Tbe mines bave all been put in good working condition, tbe old shafts and drifts have been straigbtened and widened. Steam boisting works will be placsd in operation over several of the mines in a few days, and tbe work of banling ore to tbe mill site will commence. About 100 Americon miners and 150 natives are employed.

The company bae erected several substantial buildings for offices and boarding-houses, and improvements of a permanent natnre are being made daily. Developments of an important character have lately been made in tbe San Francisco and Granaditas, bnt the company are reticent abont the matter, preferring to keep tbe matter to tbemselves for some time.

Mr. Dunham states that tbe Mexican government and people treat foreign enterprises witb mnch kindness and consideration, and welcome tbe arrival of American capital to develop tbe resourcee of the conntry. Mr. Dunbam is general agent of the company, representing the Eastern stockholders, and Mr. R. E. Meyer, an old and competent mining man, is tbe superintendent.—*Tombstone Epitaph.*

Heating by Sunshine.—Professor E. S. Morse, of the Essex Institute, has devised an ingenious arrangement for utilizing the beat in the sun's rays in warming onr houses. His invention consists of a eurface of blackened slate under glass fixed to the sunny side or sides of a house, with vents in tbe walls, so arranged that tbe cold air of a room is let ont at the bottom nf tbe alate, and forced in again at tbe top by the ascending beated column between tbe slate and the glass. The out-door air can he admitted, also, if desirable. The thing is so simple and apparently self-evident that one only wondera that it has not always been in use. Its entire practicalness is demonstrated in tbe heating of the professor's study in his oottage at Salem. The value of the improvement for daily warming buildings like churches and schoolhouses, which, when allowed to get cold between using, consume immense quantitiee of heat before they are fairly warmed again, is evident. Of course some other means of heating must be available when the sun does not shine. But in tbe colder regions, say in the far Northwest, the sun shines a greater part of the time, and bencs the saving of artificial heat would he very large if the sun heat could he "turned on" for eight or ten hours out of tbe twenty-four.—*Scientific American.*

Latest advicee from Harrisburg state that tbe miners are all actively engaged in preparing for the summer work, hut it is not expected that mnch will he done before tbe commencement of July, as the ground is covered with snow,

MECHANICAL PROGRESS.

Crystallization of Iron.

The theory that pieces of wrought iron or steel will crystallize by merely hanging for a certain length of time in a vertical position seems to be confirmed as true in the following instance. At the recent meeting of the Civil Engineers' Club, of Cleveland, Ohio, Mr. N. P. Bowler read a paper on the above subject, from which we extract as follows:

We had a chain in daily use in our foundry—used for raising flasks and castings—requiring it to hang in a vertical position most of the time. It had been in use probably eight or ten years. The links were of about one-half inch wire, as you can see by this piece of it. The service usually required was light compared with the ability of the chain. One day a link broke squarely off. The chain was sent to the blacksmith shop for repairs. The smith called my attention to the fact that if he put any of the links on end upon the anvil a light blow of the hammer would break them into four pieces. He tried several of them, and they broke as easily as poor cast iron. I asked him to put a link in the fire, heat it to a red heat, and let it cool gradually. He did so, and found it would not break then, but bend like good iron. I had the chain mended, and after emptying one of our large ladles of the molten iron, thus leaving it red-hot, the chain was put into it to remain all night. That was done over three years ago. The chain has been in constant use ever since, with no signs of weakness by crystallizing.

We served all our chains the same way, by heating them and cooling gradually, and have had no recurrence of this kind. I would recommend that the ladle shanks used about this foundry be treated the same way.

A very interesting fact was related to me not long since by a division master mechanic of the Lake Shore & Michigan Southern railway. He had just made two fire-boxes for a couple of his engines from steel plats or homogenous iron. They were completed, and the engines were ready to run; steam had been got up in both, and found all right.

The following day the fireman of one was told to fire up his engine, the same as he had fired the day before. After starting a pretty good fire, and seeing no signs of steam, he ran horror-stricken to tell his engineer that there was not a drop of water in the boiler, and that everything was red-hot. The master mechanic, who happened to be there, quieted his fears by telling him to "never mind—just pull your fire and let the engine stand and cool off."

That was ten years ago, and that fire-box has been in use all the time, and is good to-day; while its mate, made of the same material, lasted but a few years before it cracked and became useless.

SAWING STONE WITH SHOT.—The *Manufacturer and Builder* replies to the query of a correspondent who seeks information on this subject: We know nothing, from personal knowledge, of the value of iron shot for stone-sawing as compared with sand, never having had the opportunity of witnessing the operation. We have, however, repeatedly been informed, on what we regard to be most competent authority, that the shot is decidedly superior to sand in cutting power, and that it has been found remarkably well adapted for the purpose. We are informed, for example, that marble may be cut from three to four times as fast by the use of shot as by the process commonly used for the purpose with the same saws, taking only about half the power in proportion to the quantity sawed. A blade one-quarter of an inch thick is found to be worn away an inch in cutting 48 inches deep in granite, or 250 inches deep in marble. The mud from working is run into catch-pits, and the fine particles of iron thus saved are used for smoothing granite, cutting faster and lasting longer, it is said, than emery. Hard, sharp sand, in being ground to the finest mud, will, it is found, wear away about its own weight of glass; coarse-grained emery, about twice its weight; while iron shot, passed through a No. 70 sieve, will, it is affirmed, wear away about 50 times its weight of glass. It is said to be necessary, however, that all journals and rubbing surfaces of the machinery be protected from the shot with unusual care, as it cuts and wears far worse than sand. We believe this process is in very general use in large establishment all over the country. The inventor is Mr. B. C. Tilghman, 1127 Girard street, Philadelphia.

FORMATION OF ALLOYS BY PRESSURE.—W. Spring has shown that, when a mixture of bismuth filings, cadmium, and tin, in the proportions necessary for the formation of Wood's alloy, is subjected to a pressure of 7,500 atmospheres, the mass thus obtained powdered and again subjected to the same pressure, a metallic block is formed which has all the physical properties of the alloy. Its specific gravity, color, hardness, brittleness, and fracture are the same; and when thrown into water heated to 70°, it melts at once. In like manner Rose's metal was made by subjecting the proper mixture of lead, bismuth, and tin to high pressure. If zinc and copper filings are repeatedly subjected to pressure, a mass resembling brass is finally obtained.

ELECTRO-MOTORS.—It is but as yesterday that it was first seriously proposed to employ electricity as a cheap motor for heavy work, and already wonderful progress has been made. The experiment carried out at Leytonstone, where a tram car was run by an electro-motor driven by a number of Faure's secondary batteries, is the most important public trial yet made, and it may soon lead to most important results. Roughly stated, the tests at Leytonstone were in this wise: A tram car was fitted with an electro-motor, which was geared to the wheels by a merely makeshift arrangement of toothed wheels. Under the seats of the car were placed some of Faure's secondary batteries. These batteries had been charged previously by a dynamo-electric machine driven by a steam engine. The electric energy stored up in the secondary batteries was used to drive the car by means of the electro-motor; and this it did very effectually, several good runs being made. It has been shown by actual experiment that a Faure accumulator weighing about 300 pounds will drive a tram car with forty-six passengers for a journey of two miles. It is, therefore, practicable to run tram cars without either horses or steam engines, each tram car carrying its own motive power; and by the establishment of a suitable number of stations, fitted with gas or steam engines and dynamo-electric machines, a constant supply of motive power could be stored up in Faure accumulators, ready for use. In this way lines of tram cars, and even omnibuses, could be worked without horses, and with the absence of that noise and nuisance which a locomotive causes.

DESTRUCTION OF RAILS IN TUNNELS.—Continental railway engineers have for some time past noticed that the destruction of rails in tunnels is exceedingly rapid, the rails showing, besides the usual marks of wear, longitudinal cracks, which gradually increase in size until, eventually, the table of the rail is completely separated from the shank, sometimes for considerable lengths. It has also been noticed that the best rails do not escape this kind of deterioration, which is attributed to the sand used for insuring the adhesion of the wheels of the engines to the rails. It is impossible to dispense with the use of the sand, since the rails are covered with a deposit of fatty nature, due to the oil used in lubrication, and to the water resulting from the exhaust steam, which is speedily condensed in the confined space of a tunnel. The grains of sand become gradually incrusted in the slightest superficial scratches of the table of the rails, and at last act as wedges under the repeated pressure of the wheels. It is naturally of great importance to introduce a remedy for this evil, and it is stated that in the Hauenstein tunnel, Switzerland, a jet of hot water from the locomotive was employed to free the surface of the rail from the fatty deposit, and perfect adhesion of the wheels was thus insured.

THE PASSIVE STATE OF IRON.—A peculiar condition of the metal, in which it is found to be indifferent to the action of substances that ordinarily exert a powerful chemical action upon it, has recently been studied by Rsmann, with the following results: He affirms that iron is rendered passive when it is heated in the air, when it forms the positive electrode of a galvanic couple, and also when it is immersed in any of the following named-liquids: Nitric acid, solutions of the nitrates of ammonium, iron, silver, aluminum, nickel and cobalt. The passive state, he holds, is due to a firm coating of the magnetic oxide on the surface of the metal, this oxide being sparingly soluble in strong nitric acid, but freely soluble in dilute nitric acid. Finely divided iron, which has been immersed in any of the above liquids, and has been carefully dried in a current of an indifferent gas, may be shown to contain a considerable quantity of oxide by the formation of water when ignited in a current of hydrogen. When iron is dipped in nitric acid, a portion of the metal dissolves, forming ferric nitrate, which is reduced to ferrous nitrate by the excess of iron present. A further reduction then takes place, the ferrous nitrate being converted into ammonia and magnetic oxide.

INFLUENCE OF MECHANICAL HARDENING UPON THE MAGNETIC PROPERTIES OF IRON AND STEEL.—Many investigations upon the relations between the molecular conditions of iron and steel produced by heat, by torsion, and by annealing processes, and the resulting changes in magnetic conditions, have been made. It appears, however, that the effect of mechanical hardening has not been properly investigated, and the results of researches by Mr. L. M. Cheesman will, therefore, probably be of interest. Mr. Cheesman's method of research consisted simply in determining the magnetic moment of the magnetic bar after it had been subjected to mechanical pressures. The results obtained may be summed up as follows: Iron in a mechanically hard condition can receive more permanent magnetism than in a soft condition. The magnetic moment of a steel magnet in a mechanically hard condition is greater or smaller than in a soft condition, according as the ratio of its diameter to its length is lesser or greater than a certain limit.

A LARGE BELT.—An English firm has recently shipped to a mill near Bruecele a double driving belt 75 inches wide and 153½ ft. long, and it is to transmit 650 indicated horse power.

SCIENTIFIC PROGRESS.

Man and Insects.

The only nerves (worth mentioning) in the human body which are not under the control of the brain, are those of the heart and other internal organs; and over these parts, as everybody knows, we have not any voluntary power. But all our limbs and muscles are moved in accordance with impulses sent down from the brain, so that, for example, when I have made up my mind to send a telegram to a friend, my legs take me duly to the telegraph office, my hand writes the proper messags, and my tongue undertakes the necessary arrangements with the clerk. But in the insect's body there is no such regular subordination of all the parts composing the nervous system to a single central organ or head office. The largest knot of nerve matter, it is true, is generally to be found in the neighborhood of the sense organs, and it receives direct nerve bundles from the eyes, antennæ, mouth, and other chief adjacent parts; but the wings and legs are moved by separate knots of nerve cells, connected by a sort of spinal cord with the head, but capable of acting quite independently on their own account.

Thus, if we cut off a wasp's head and stick it on a needle in front of some sugar and water, the mouth will greedily begin to eat the sweet syrup, apparently unconscious of the fact that it has lost its stomach, and that the food is quietly dropping out of the gullet at the other end as fast as it is swallowed. So, too, if we decapitate that queer Mediterranean insect, the praying mantis, the headless body will still stand catching flies with its outstretched arms, and fumbling about for its mouth when it has caught one, evidently much surprised to find that its head is unaccountably missing. In fact, whatever may be the case with man, the insect, at least, is really a conscious automaton. It sees or smells food, and it is at once impelled by its nervous constitution to eat it. It receives a sense impression from the bright hue of a flower, and it is irresistibly attracted toward it, as the moth is to the candle. It has no power of deliberation, no ability even to move its own limbs in unaccustomed manners. Its whole life is governed for it by its fixed nervous constitution, and by the stimulations it receives from outside. And so, though the world probably appears much the same to the beetle as to us, the nature of its life is different. It acts like a piece of clock-work mechanism, wound up to perform a certain number of fixed movements, and incapable of ever going beyond the narrow circle for which is designed.—*Grant Allen, in Knowledge.*

SOUND, LIGHT AND HEAT.—Prof. Tyndall lately delivered the second lecture of his course at the Royal Institution. The explanations given by Huyghens of the phenomena of reflection and refraction, as well as of the properties of convergent and divergent lenses, had, he said, been fully verified by the progress of time and science. The lecturer showed that there are sound lenses also, and that the wave theory affords a no less adequate explanation of their properties. He demonstrated, by the test of the sensitive flame, that cotton net, because porous, transmits waves of sound, while the interposition of a non-porous body leaves the flame unaffected. Just as the passage of light was hindered by clouds, although the air and light of which these are made up were alike transparent, so acoustic clouds obstructed sound. Acoustic cloude consisted of layers of heated air with intermediate layers less heated. The lecturer formed an artificial cloud of the kind, which was known to intercept sound; the sound was thus thrown back in miniature echoes. Another analogy between light and sound was brought out by comparing the solar spectrum with a scale of notes produced by striking a graduated series of tuning forks. To illustrate Dr. Wollaston's observation, that certain sounds are inaudible to many ears, Prof. Tyndall blew a small whistle, whose low, though shrill, note instantly agitated the sensitive flame, while full half of those present, as a scientist had predicted in conversation with the lecturer beforehand, heard nothing. Resemblance were also pointed out between the absorption of light and that of sound. On the sound struck from one tuning-fork being quenched, it was proved to have been not annihilated, but simply absorbed by an adjacent fork. In like manner the yellow ray in the solar spectrum was absorbed by sodium vapor as the metal passed under the eyes of the audience in that form, leaving the place of that color in the spectrum marked by a black band.

THE ELECTRIC LIGHT AND ACOUSTICS.—The introduction of the electric light in the Grand Opera House, Paris, has, as might have been expected, greatly improved the acoustical properties of the building. Of course, the incandescent system can produce no disturbance of the atmosphere and no heated gases.

THE TONGUE.—Of the sense of taste, Prof. McKendrick states that the base of the tongue is most sensitive to bitters and the tip to sweets. A substance must be soluble in the fluid of the mouth to create taste, but no definite relation has been found between the chemical condition of bodies and their taste.

The Creation of Electric Forces.

A water-wheel, by being employed to generate electricity, may light our rooms, cook our dinner and ripen our peaches. We can have light from it by which we can work as easily at night as in the day—a light which will neither consume our fresh air, nor vitiate it with foul gases, nor smoke our ceilings and destroy our curtains; which can set fire to nothing; the globe of which can be hooked to an invalid's bed-curtain without risk, or attached to flexible wires and taken into the most confined corner to give light to a workman without danger of fire. It would fill a volume to state at length all the practical advantages which this development of electricity has opened up already, and more than a volume to state all that it may be expected yet to accomplish. Let it also be understood that while the foregoing illustrations have been stated in relation to water power, they are equally true for the other powers, such as steam engine, gas engine, horse power or human labor. The fixed engine on a farm can do the plowing hundreds of yards off. The gas engine that pumps water by day can light the house at night. The horses that drag coal carts for many miles to work a steam engine in some outlying place, can be used at home instead, to work an electric machine, with no loss of time, and in many cases with less waste of labor. The convicts on a treadmill can be doing work by it at any part of, or even outside the prison. In a word, the power for work can be generated by any ordinary means, and at any place where the means exist, and can be economically conveyed to the spot where it is to be usefully applied without loss of time and practically in full strength. The tide on the shore can do work far inland; the stream in the mountain gorge can do work on the hilltop; the wind-mill on the eminence can do work in the valley; the horse in the yard or the man in the out-house can do work inside the dwelling. And with all its power, and its universality of application, this new servant which science has supplied us with is the most docile of menials. A touch of a lady's finger will bring into action a power which a thousand men could not resist; another touch will stop its action, or reverse it, in a moment.—*Am. Inventor.*

FOGS.—At a recent meeting of the Physical Society, London, Mr. Newth exhibited some interesting experiments illustrating the formation of fogs. In 1875, Mr. Marscart showed that mere reduction of temperature or pressure in the atmosphere might not give rise to fogs, unless the air were pervaded by solid particles of smoke or certain gases, such as sulphurous acid gas, to form a nucleus for the water vapor to condense upon. This fact was ably demonstrated last year by Mr. Aitkin, of Falkirk, and Mr. Newth's experiments were designed to show it on the lecture table. For this purpose he had arranged a bulbous flask of glass connected to an air pump, and containing a little water in the bottom of the flask. The beam from an electric lamp could be thrown through the flask so as to illuminate the interior. Mr. Newth first admitted some of the mote-filled air of the room into the flask, and by partially exhausting it, produced a thick fog; but on washing out the motes by agitating the water in the flask, the fog became far less appreciable. A small quantity of smoke introduced into the flask produced a thick fog; so, also, did the fumes from a piece of burning sulphur, and even a platinum wire rendered incandescent by an electric current gave off sufficient solid particles of dust or other matter to produce a fog. The inference is that even with gas grates and stoves we shall not get rid of fogs, though they be of a lighter color and less dense than with coal fires.

EFFECTS OF HEAT ON ELECTRICAL CONDUCTION.—Prof. F. Guthrie, F. R. S., recently read a paper on the discharge of electricity by heat. He showed by means of a gold-leaf electroscope, that a red-hot iron ball, when highly heated, would neither discharge the positive prime conductor of a glass electrical machine nor the negative one, but on cooling the ball a temperature was found at which the ball discharged the negative conductor, but not the positive one. Lastly, on cooling the ball still further, but not below a glowing temperature, it was found to discharge both positive and negative electricity. A platinum wire rendered red hot by the current also discharged a negatively charged electroscope more readily than a positively charged one. When placed between two electroscopes, one having a + and the other a − charge, it discharges neither. When the + one was withdrawn the − was discharged; but when the − one was withdrawn the + was not discharged. There therefore seemed a tendency in a hot body to throw out + rather than − electricity. These are interesting experiments, and open a little room for discussion versus positive and negative electricity.

FINE DUST falling on vessels in the Atlantic near the Cape de Verde archipelago has often been reported, but it has so often been of a reddish hue that it is known among sailors as "red fog." In Lyons, Genoa, Sicily and other parts of southern Europe the same phenomena giving rise to "blood rains," has frequently been recorded, and 20 cases, between 1803 and 1870, have been collected, by Flammarian, occurring in Europe. Prof. Ehrenberg microscopically found the Atlantic dust rich in infusorial forms belonging to equatorial South America.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending May 18.		Week Ending May 25.		Week Ending June 1		Week Ending June 8.	
Alpha	35c	....	30c	....	35c	....	35c	35c
Alta	1.85	80c	1	80c	70c	55c	80c	55c
Andes	45c	40c	50c	45c	45c	35c	50c	40c
Argenta	1.95	90c	1.10	1.000	70	1.35	2.25	1.15
Ashaw	15c	10c	15c	....	15c	....	20c	....
Auburn	....	....	....	....	....	....	....	....
Belcher	65c	25c	30c	....	35c	25c	35c	25c
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	5	1.30	4.95	4.15	5.40	3.50	5.90	4.55
Bodie	80c	25c	25c	20c	20c	10c	30c	5c
Bonanza	30c	25c	25c	....	25c	....	....	....
Bonheur	....	....	20c	....	20c	....	20c	5c
Belle Isle	....	....	....	....	....	....	....	....
Bullion	5	5	4	3	5	4.95	5	4.90
Bonanza	45c	35c	40c	....	35c	5c	35c	30c
Bulwer	2.00	....	1.85	....	2	1.90	2	....
Bunker	....	....	30c	....	....	....	....	....
Caledonia	....	....	10c	....	....	....	....	....
Chain Rock	....	....	....	....	....	....	....	....
Confidence	2.20	....	1.90	....	1.95	1.20	2.05	1.75	2.20
Crocker	....	....	....	....	....	....	....	....
Caledonia	....	....	....	....	....	....	....	....
California	25c	15c	20c	15c	20c	10c	20c	15c
Challenge	....	....	....	....	....	....	1	....
Commercial	....	....	....	....	....	....	....	....
Con. Pacific	....	....	....	....	....	....	....	....
Crocker	....	....	....	....	....	....	....	....
Dardanelles	1	1.10	1.45	1.35	2	1.45	55	1.70
D. Mc. Dimlin	20c	....	20c	....	....	....	20c	....
Eureka Con.	30c	25	1.25	1.00	25	25	75	....
Eureka Tunnel	25c	60c	45c	....	25c	20c	....	....
Exchequer	20c	10c	25c	15c	20c	10c	30c	....
Endowment	....	....	....	....	....	....	....	....
Grand Prize	15c	5c	10c	5c	10c	5c	20c	15c
Gentry Gate	....	....	....	....	....	....	....	....
Goodshaw	25c	....	15c	10c	25c	20c	20c	....
Gould & Curry	2.40	2.00	1.80	1.40	1.70	1.30	2	1.35
Hale & Norcross	1.35	40c	70c	30c	40c	25c	80c	25c
Hand Cumber	....	....	....	....	....	....	....	....
Hardenbergh	....	....	....	....	....	....	....	....
Independence	15c	....	10c	....	5c	....	....	....
Julia	35c	25c	25c	20c	25c	5c	20c	5c
Jackson	....	....	....	....	....	....	....	....
Justice	15c	....	15c	....	20c	....	....	....
Kentuck	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	10c	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Locke	....	....	....	....	....	....	....	....
Mary Ellen	....	....	....	....	....	....	....	....
Mexico	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Mexican White	3.30	30	30	....	3.30	....	3.40	30
MacKinaw	....	....	....	....	....	....	....	....
Mono	1.30	1.00	1.35	....	....	80c	50c	55c
Maribosa	6	4.95	5	4	5	4.70	5	5
Mt. Davidson	5.30	3.40	6	....	....	4	....	....
Mt. Penn	80c	5c	40c	....	10c	....	....	....
Navarre	1	80c	1	95c	2	35c	1	1.90
New York	....	....	....	....	....	....	....	....
Northern Belle	6	3	4	3	5	3	7	3
North Nevada	1	35c	3	....	40c	70c	85c	75c
Navajo	2	1.80	2	1.30	2	2.05	....	....
Occidental	15c	....	10c	....	....	15c	20c	....
Ophir	3.05	1.55	3	2	2.85	2.50	2.75	2.45
Original Keystone	....	....	....	....	....	....	....	....
Overman	25c	10c	5c	....	5c	....	25c	....
Ore	20c	15c	15c	10c	20c	10c	15c	5c
Pacific	....	....	....	....	....	....	....	....
Prompt	20c	15c	15c	10c	15c	10c	15c	15c
Plumas	2	2	3	2.30	3.00	2.30	3.40	2
Quicksilver	....	....	....	....	....	....	....	....
Quicksilver pf.	....	....	....	....	....	....	....	....
Quartz Mountain	....	....	....	....	....	....	....	....
Rescue	....	....	....	....	....	....	....	....
Rappahannock	....	....	....	....	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Sierra Nevada	1.30	80c	90c	55c	55c	30c	1.10	20c
Sag Bender	5	3	4	....	....	....	....	....
Sierra Nevada	6	3	6	5	5	5	6	5
Silver Hill	....	....	20c	....	....	10c	5c	5c
Silver King	55	35	75	55	80	60	95	60
Sunset	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	20c	....
Sovereign	80c	60c	75c	60c	70c	50c	85c	30c
Solid Silver	25c	....	....	....	....	....	30c	....
Star	25c	....	....	....	....	....	....	....
Stock Nevada	7	6	6	6	7	6	7	6
Syndicate	....	....	25c	....	....	15c	....	10c
Town Ore	15c	....	15c	....	....	....	20c	....
Tigray	3	....	....	....	....	....	3	2
Tuscarora	....	....	....	....	....	....	....	....
Union Con.	70c	50	70c	50	65	50	70c	50
Utah	2.45	2	2.30	2	2.40	2.10	2.55	2.05
Wood	....	....	30	....	30	....	30	....
Wales	....	....	40c	40c	40c	....	50c	40c
Yellow Jacket	35c	40c	70c	40c	70c	35	65c	40

Sales at S. F. Stock Exchange.

Thursday A. M., June 8. 250 Sierra Nevada.....30@35
450 Alta.....30c 50 Sovereign.....30c
200 Andes.....40c 100 Union.....35@36
400 Belcher.....[illegible] 450 Utah.....3
700 Bonanza.....25c 200 Wood.....30
200 B & Belcher.....7.00 AFTERNOON SESSION.
300 Caledonia.....20@25c 50 Belcher.....25c
500 Con. Virginia.....35c 500 Con. Virginia.....40c
100 Chollar.....35c 50 Eureka Con.....35c
350 Gould & Curry.....1.50 700 Goodshaw.....25c
80 Hale & Nor.....85c 300 Hale & Nor.....40c
250 Ophir.....2.05 50 Mono.....1.15
50 Overman.....25c 80 Ophir.....2.05
250 Potosi.....40c 30 S Nevada.....35
300 Savage.....35c

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Eureka Con., May 25th and 26th, $3,585.34: Northern Belle, 25th, $21,139.87: Independence, 26th, $11,890: Benny O'Neal, June 1st, $7,000; Christy, 25, $4,230: Eureka Con., May 29th and 30th, $10,206.23: Consolation, 30th, $15,439.69: Christy, June 5th, $2,083: Benny O'Neal, 4th, $3,662.45: Navajo, 1st, $4,306.13: North Nevada, 1st, $3,347.60: Eureka Con., 1st, $4,500.23: Northern Belle, 2d, $17,225.85: Bodie, 5th, $11,863: Horn Silver, May 30th, $17,300: Hanover, 30th, $1,865: Sturmont, 30th, $3,800: Nevada, 30th, $1,350: Silver Reef for May, $73,497: Bullionville, June 1st, $3,465: Hanover, 1st, $1,890: Germania, 1st, $20,000: Germania, 3d, $3,400: Hanover, 3d, $1,886: Sturmont, 4th, $2,400.

Meetings and Elections.

Crown Point M. Co., June 7th. Directors—C. L. Wilder, President; James Newlands, Secretary; A. K. P. Harmon, Vice-President; Samuel L. Jones, Superintendent; J. E. Dodmann, J. P. Jackson, S. F. Morrow.

Metallic-Egotist Con. M. Co., June 8th. Directors—A. W. Rose, Jr., President; S. Heydenfeldt, Vice-President; Wm. Willis, Secretary and Treasurer.

Columbia M. Co., June 8th. Directors—Thos. Bell, F. Lopez, S. Sanchez, Duncan C. Macky, President, Thos. Bell, Vice-President, F. Lopez, Secretary, W. Lewis Oliver, Superintendent, F. W. Allen.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argenta M. & M. Co	Nevada	20	20	Apr 29	May 29	June 12	E. M. Hall	327 Pine st
Alpha S. M. Co	Nevada	25	50	May 6	June 6	June 27	W. H. Watson	302 Montgomery st
Bonheur Gem M. Co	California	3	20	May 23	June 23	July 20	F. F. Luny	330 Pine st
Belmont M. Co	Nevada	22	20	May 20	June 24	July 17	J. W. Pew	330 Pine st
Benton Con. M. Co	Nevada	5	20	May 27	June 13	July 20	Wm. H. Watson	302 Montgomery st
Bullion S. M. Co	Nevada	24	25	May 29	July 1	July 25	A. J. McDonnell	327 Montgomery st
Chollar M. Co	Nevada	8	25	May 4	June 29	June 30	W. E. Dean	308 Montgomery st
Consolidated Gem M. Co	California	25	25	May 6	June 15	July 15	D. S. Chisholm	327 Pine st
Fair Villa M. Co	Arizona	1	50	Apr 24	May 29	June 19	J. H. Sayre	330 Pine st
Gould & Curry S. M. Co	Nevada	42	50	May 23	June 29	July 20	A. K. Durbrow	308 Montgomery st
Hale & Norcross S. M. Co	Nevada	76	50	May 16	June 20	July 11	J. F. Lightner	308 Montgomery st
Hand Cumber Con. M. Co	Arizona	2	20	May 25	July 6	July 28	J. W. Pew	330 Pine st
Hanover M. & M. Co	California	4	20	June 3	July 5	July 31	F. E. Luny	330 Pine st
Justice S. M. Co	Nevada	36	20	May 22	June 27	July 18	B. F. Kelly	420 California st
Martin White M. Co	Nevada	22	25	May 9	June 20	July 20	J. J. Sperille	309 Montgomery st
May Flower Gem M. Co	California	25	10	May 31	July 6	July 26	J. Marino	325 Montgomery st
Manhattan G. & S. M. Co	Nevada	19	50	June 6	July 13	July 20	C. L. McCoy	309 Montgomery st
Mono G. M. Co	California	21	20	June 2	July 7	July 27	C. W. Sessions	309 Montgomery st
Neptune M. Co	California	5	5	Apr 20	June 1	June 19	H. Smith	307 Montgomery st
Norwich G. & S. M. Co	California	1	20	June 5	July 10	July 31	A. L. Perkins	330 Pine st
Quartzmar M. Co	Nevada	25	25	May 1	June 6	June 27	G. D. Edwards	424 California st
Prompt M. & M. Co	Nevada	5	50	Apr 12	May 16	June 6	W. E. Dean	308 Montgomery st
Quintic Manhattan M. Co	California	14	75	May 16	May 24	June 24	E. Hastres	729 Montgomery st
Savage M. Co	Nevada	23	50	May 4	June 6	June 28	T. P. Holmes	308 Montgomery st
San Pedro G. & S. M. Co	Nevada	5	10	May 10	June 12	July 10	W. G. Holmes	Sherman's Building
Sporting S. M. Co	Nevada	12	10	May 25	June 29	July 21	Geo. B. Spitmer	330 Pine st
Sierra Nevada M. Co	Nevada	23	100	May 27	June 22	July 20	E. L. Parker	309 Montgomery st
Silver Hill G. M. Co	California	4	25	Apr 12	June 10	July 10	J. W. Pew	330 Pine st
Tuscarora M. Co	Lower California	1	20	Apr 28	June 26	July 15	A. Judson	320 Sansome st
Utah S. M. Co	Nevada	29	100	May 4	June 10	June 29	G. C. Frost	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Belle Isle M. Co	Nevada	4	20	May 25	June 23	July 17	E. M. Hall	327 Pine st
Caledonia M. & M. Co	Nevada	12	25	Apr 5	May 15	June 15	W. Lewis Oliver	328 Montgomery st
Grand Prize M. Co	Nevada	5	10	May 2	June 5	June 26	E. M. Hall	327 Pine st
Santa Anita M. & M. Co	California	3	05	Apr 17	May 22	June 12	J. M. Buffington	309 California st
Scotch Hill G. M. Co	California	4	10	May 5	June 5	June 28	P. A. Berlin	420 Montgomery st
Western Home M. Co	——	5	05	Apr 10	May 12	June 15	A. Halsey	328 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Belle Isle Con. M. Co	California	G. W. Sessions	309 Montgomery st	Annual	June 19
Exhibition Gem M. Co	California	D. S. Chisholm	327 Pine st	Annual	June 30
Santa Anita M. & M. Co	California	J. M. Buffington	309 California st	Annual	June 26

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con. M. Co	California	W. Willis	309 Montgomery st	10	June 12
Consolidated M. Co	——	D. C. Bates	309 Montgomery st	25	May 27
Eureka Con. M. Co	Nevada	W. W. Traylor	309 Montgomery st	50	May 27
Northern Belle M. & M. Co	Nevada	Wm. Willis	309 Montgomery st	50	May 11
Silver King M. Co	Arizona	J. Nash	315 California st	25	May 15
Standard Con. M. Co	California	Wm. Willis	309 Montgomery st	75	June 12

The Mining Share Market.

The market has been going on for the past week with a fair amount of business, but there has been no special advance to note. Our tables give the fluctuations, which have not been marked. As to the situation on the Comstock, the *Enterprise* says:

The breasts in the lower stopes of the Union Con. (50 ft. below the 2500 level) were in very rich ore. This was where they are stoping out southward. How long this rich ore will hold out remains to be seen. However, it is good to find such ore at that depth. There are some signs of this deposit making more strongly to the northward than was at first expected—that is to the north and west.

The Mexican west crosscut No. 21, on the 2700 level, is also cutting stringers of ore, as also is north drift No. 3, on the 2700 level of the Sierra Nevada. Indeed, at the depth of 2800 ft. and 2700 ft., in almost every direction, is found as fine vein material as was ever seen in any portion of the vein. Supt. Patton says that even surrounding the big bonanza was found no finer looking vein material. It has a live and ferrule appearance and is highly metalliferous. Not only are there great numbers of streaks of quartz that carry silver and gold, but all the rock carries a great deal of iron of exactly the same kind that was found in the surroundings of the big bonanza. The scattering deposits of ore found in various directions on the 2500, 2600 and 2700 levels indicate that they are the forerunners of a big body lying somewhere below. This body will probably be found further to the eastward. Until quite recently it has been supposed that the main north and south lateral drift run on the 2700 level of Union and Mexican was at or near the east line of the vein. It has now been satisfactorily ascertained that this is not the case. What was thought to be the east wall is nothing more than an accidental separation—a sort of seam or division in the midst of the ore channel. Just where the east wall will be found is a matter of conjecture.

When found, we are of the opinion that ore will be found against it. In traveling down Seven-mile canyon a ridge of black rock resembling black dyke is to be seen on the slope of a mountain on the north side of the canyon. This rock will probably be found to form the east wall of the vein, as on the surface all is vein material until this ridge of rock is reached. This is a great distance east of the Union shaft on the surface, and is no doubt well to the east below, as it has an eastern dip that would carry it away from the shaft.

There are now beginning to be seen to the eastward on the lower levels indications that this east wall—wherever it may be—is becoming more vertical, as the stratification of the rock is bending downward. This is considered a very promising indication, as the ore, now so much scattered, would be liable to be concentrated at some point. However this may be, it is probable that the eastern part of the ore channel will soon be more thoroughly examined. Even on the upper levels the ore so long looked for may lie off on the east side of the vein.

On the 2900 level of the Union a drift has been started south from the joint Sierra Nevada station. This will almost immediately pass into very interesting ground.

On the 2500 level they have not yet sunk below the sill floor of the lower stopes, and probably will not. It is at present the intention to prospect the lower part of this deposit by raising from the 2600 level.

On the 2900 level of the Mexican a crosscut is now going into a wholly unknown region. This has been started far enough south to avoid the water that was tapped when the diamond drill was sent ahead from the face of the main north drift.

Oakland Manufactures.

We see by the Oakland *Times* that nearly all the shares of stock in the Judson Nail factory, offered to the citizens of Oakland, have been subscribed, and the company has decided to locate at the Emory tract, between the railroad and the bay. It was well known from the start that the enterprise would be a paying investment, and no difficulty was experienced in disposing of the stock. Great care was taken to place the shares in the hands of enterprising business men, and the result is that many of our best citizens are stockholders. Among those who have subscribed are Egbert Judson, C. S. Chamberlain, T. P. McFeely, J. Benedict, John Finn, Theodore Green, H. D. Bacon, E. B. Dean & Co., V. D. Moody, F. Delger, A. J. Snyder and J. B. Wyman. The capital stock is $500,000. It is proposed to manufacture horse-shoe nails, tacks, brads, finishing nails, Victor mowing machines, pulleys, hangers, files, etc. The company has such facilities and advantages that it can manufacture the peculiar stock at a much more reduced rate to the purchaser than now. The strongest iron, the Clipper Gap pig iron, of which Mr. Judson is the largest owner, will be used. The enterprise will give employment to 200 persons, and a large number of boys will have an opportunity to learn useful trades. No Chinese will be employed. Next Monday ground will be broken on the site selected, consisting of three acres of land, and the erection of six buildings will be begun immediately. Two buildings will be 100x40 ft. each; the second building, 175x100 ft.; the foundry building, 100x40 ft.; wood shop, 140x50 ft.; warehouse, 160x40 ft., one story in height.

The factory, being located upon the railroad, and not far from the bay, will have unusual facilities. Mr. Chamberlain, the manager, was in Oakland yesterday, and was jubilant over the splendid prospects. Only a few more shares are to be sold.

In Columbus district the Princess mill is being pushed steadily to completion, and will be running by the 15th of August. On the 10th of June the Princess M. & M. Co. will begin to purchase ore from prospectors in the camp. This departure of the Princess will help to develop the camp and lay the foundation of a large town, and many rich mines will come to the front as paying properties.

The *Golden Estate* says it is thought the Mescalero Apache reservation will be reduced in size sufficient to throw open to prospectors the rich mineral lands thereon, thus obviating the necessity for removal of the Indians. The occupants express a willingness to have the minerals revert to the Government.

TOMBSTONE produced in April $404,846.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

POTOSI MINE.—Amador *Ledger*: This mine during the past year has been operated by Messrs. Hobbs & Richards, under the superintendence of Mr. Chas. Thomas. The shaft is down 275 ft and levels run at 70 ft and 200 ft. In the 70 ft. a tunnel is run south for 50 ft, showing a ledge on the hanging wall 2 ft thick and 10 ft of ledge matter on the foot wall. In the 200 level, one tunnel was run 90 ft north, showing a body of ore 10 ft thick. On the south side in same level a tunnel was run 133 ft, giving a ledge of an average thickness of 5 ft. Stoping from this level kept the 10-stamp mill supplied with ore during the year. The mine is shut down for a while. As depth was gained the value of the ore increased and large quantities of sulphurets were found coming in the slate. The average value of the rock has been such that it is the intention of the company to add another 10 stamps to their mill; then, instead of making but a little over expenses, they will clear a good profit on their investment. This property is regarded as a valuable one, and great praise is given the owners for done so well on a small capital. The prospecting has been on the hanging or east wall; but every indication goes to show that the best rock will be found on the foot wall; and future operations will be carried on there as well as on the hanging wall.

CALAVERAS.

LAMPBEAR MINE.—*Chronicle*, May 22: Operations in the Lampbear mine are being pushed right along. The mine is now clear of water, and the pumps are kept working. The men have been engaged during the week in cleaning out the levels and are about commencing to take out ore. A. Pickering, Esq., of Railroad Flat, a man who has a thorough knowledge of milling operations, has been engaged to take charge of the mill, which it is expected to start next week.

MILL CLEAN-UP.—A clean-up has recently been made in the Mammoth hydraulic claim on Tunc el ridge, owned by J. F. Veith, Esq. A run of several months was made and resulted in a clean-up of about $5,000.

DEL NORTE.

HAPPY CAMP NOTES.—Cor. Del Norte *Record*, May 27: The mining season has turned out more favorable than I expected. Most of the claims have plenty of water and are running night and day, and, as there is still a large body of snow on the mountains, the water is liable to hold out until late in the season. The yield of gold for the season thus far has been quite up to the average, and I have heard but little complaint from the miners. The prines of this section will compare favorably with those to any part of this northern district. I do not wish to infer that our mines are fabulously rich, but if operations are conducted on a business basis, with the same care and careful management that one would give to any other pursuit or enterprise, the yield upon the investment is far ahead of any mercantile or mechanical business that he can be engaged in.

EL DORADO.

GOPHER-BOWLDER.—*Mountain Democrat*, June 3: Landecker has obtained control of the Gopher-bowlder mine and mill, which has been lying idle for some weeks, and he will soon resume operations upon it. We have great faith in the mine, and feel quite sanguine that it can be developed into a fine property if properly handled.

GOOD CLEAN-UP.—At the Cedar Springs mine, on Cedar ravine, near this city, a clean-up of over $3,300 was made last Saturday, as a result of a 12 days' run. This is the best clean-up made in that mine in a long time, and the prospects ahead promise an improvement on these figures.

QUARTZ MILL AND HOISTING WORKS.—A BARGAIN.—Mr. E. Myers, a San Francisco attorney, arrived in Placerville last Wednesday, to remain a few days. He is the attorney and agent of a New York company that owns the Chaparral mine and mill property, in Kelsey township. The mill has 10 stamps, 5 of which are comparatively new. The hoisting works are quite complete. The mine, having disappointed expectations, the mill and hoisting works are offered for sale at a bargain.

MARIPOSA.

MINES.—*Gazette*, June 3: The Christmas Gift mine and mill were into full operation last Monday. The mill has five stamps, and is located on Cy. Thompson's ranch, in Cathey's valley, some two miles from the mine, which is on the Guadalupe mountain. The ore is decomposed talc slate, and is considered rich.

COULTERVILLE.—Mr. Mast's force at the Fairview mine are pegging away as rapidly as possible, and he has a vein from 2½ to 30 inches wide and very regular, and of good milling ore. He also informs us that he has completed a first-class trail up the river to the old Derick mill-site, and will commence packing quartz down to the Banderita mill inside of a week, and will soon have the Banderita mill clattering away on quartz from the Fairview vein. I am also informed by the same gentleman that they will soon reach or drive the 1200-ft per on the Banderita tunnel, and that one can stand at the face of the works and see a person at work at the mouth of the tunnel. That is the straightest tunnel on the coast. Only think of it, 1200 feet as straight as a gun barrel! This tunnel was run by Mr. John Roberts, an old and well-known miner of Mariposa county.

WHITLOCK CON.—The Whitlock Con. M. Co.'s mines, consisting of the Margaretha, Golden Fleece, Bessie Collins, Fortuna and Goodman mines formerly located by Fritz, Snyder & Co., situated near the head of Whitlock's creek, about 5 miles north of Mariposa, in this county, have recently been surveyed and platted by R. B. Thomas, Deputy U. S. Mineral surveyor, and re-located by John Hirman, George H. Schofield and others, with a view to further developing said mines, which have lain idle for the last 15 years.

MONO.

THE MAY LILLY.—Homer *Index*, June 3: The Lake Canyon toll road has been put in repair, and the first teams went up to the May Lilly tramway on Thursday. The tramway is being repaired and will be ready for use by Monday. A contract has been let to John W. Stewart for hauling ore from the foot of the tramway to the mill during the season, and the work of transportation will be in charge of C. M. KNOX, who now has on the road 7 teams of 6 heavy horses each, each team drawing a wagon capable of carrying 6 tons of ore at a load. As many more wagons and teams as required will be put on. The mill is being put in order and will be started up in a few days. The affairs of the mine are under the immediate personal supervision of M. B. Kellogg, one of the general managers of the property, who is assisted by A. D. Shaw, for the past 7 months assistant and acting superintendent.

BODIE.—*Free Press*, June 6: The resumption of work at the Standard mine, and the starting up of both mills, has brightened up matters about Bodie very materially, and people are now watching developments in other quarters with renewed and increased interest. The work in the Noonday's attracts the most attention at present. The crosscut reached the vein last Sunday, and a drift was started north and south, partly in the vein and partly in the foot wall, which drift is now 12 ft long. In the winze, 75 ft above, there are five or six ft of white low-grade quartz between the foot wall and the ore body, and that portion of the drift which is in the vein is in that description of quartz, though showing more mineralization than above.

RICH FLOAT.—From time to time for some years past float rock rich in gold has been found along the eastern slope of the high mountain range over hanging the western arm of Mono lake, and at present that region is swarming with prospectors. One rich ledge has been

found above Wilson's (formerly Sim. Baker's) ranch, and as the float ceases at about the same altitude all along the mountain, prospectors feel confident that they will be able to find the main lode at several different points before the summer is over. Some of the float rock found is so rich in gold that it is suitable for the manufacture of jewelry.

NEVADA.

WASHINGTON M. Co.—Grass Valley *Union*, June 3: At the meeting of the stockholders of the Washington M Co., held on Thursday evening of this week, to take into consideration the disposition of the stock held by the company whether to offer it for sale or distribute it pro rata to the stockholders—it was determined to make no present distribution of it. The present appearance of the mine is quite encouraging, and the opinion prevailed at the meeting that the stock would command a much better price a few months hence, if offered for sale, than it would command now, and provide more funds to the treasury if a sale was then deemed necessary. It was stated at the meeting that in the drift being opened on the 265 level the mine was showing good improvement, the rock showing a solid ledge of over 2 ft in thickness, with ledge matter that increased the size to about 3 ft. The ledge is handsome in appearance, showing well in heavy sulphurets and respecting in free gold.

CANADA HILL MINES.—A nice clean-up was brought in yesterday from the Charouuat quartz claim.....The new steam hoisting and pumping works at the Wide West mine of Messrs. Keith, Johnson & Co. started up Monday, and the water is being rapidly lowered. The shaft is down 70 ft, and will be put down deeper before long. There is a good ledge in the Wide West mine, the ore taken out before the machinery was erected paying as high as $60 a ton.....Ed. Moore has replaced the wheel heretofore used on the Lincoln mine with one 20 ft in diameter, and will hereafter experience no lack of power for hoisting and pumping. He has one of the best ledges in that vicinity and has been getting good returns from it for some time.....The numerous other claims at Canada Hill are doing well. A good deal of prospecting is going on there.

PLUMAS.

INDIAN VALLEY MINE —Greenville *Bulletin*, May 31: The Indian Valley mine is in good working order; the mill is running steadily with satisfactory results. Since the substitution of water power for steam the working expenses have been materially reduced. The flow of water in the lower levels is so slight that but little pumping is necessary to dispose of it.

ELIZABETHTOWN MINE.—The Corbin & Manson drift mines at Elizabethtown have been paying well all this spring; as the season advances and the ground dries out the various drifts in the ground can be still more easily worked; there will be less expense for pumping, and the drifts can be held easier by the timbering.

TAYLOR-PLUMAS.—At this mine they are still working in the upraise. During the past few days the ore has shown more free gold than for some time before. The ledge has maintained the same width and general character for weeks past. About 200 tons of ore are now on the dump.

PROVIDENCE.—On last Thursday the ledge was struck in the tunnel of the Providence mine. The ore is rich, and, at the point where it was struck, the vein is about 3½ ft thick. Since it was struck the ledge has been opened about 18 ft and shows a good body of ore.

ALTONA.—Mr. Emmons has bought out the interest of Thomas Davis in the Altona mine. The interest held by Mr. Davis had been allowed him for prospecting. Mr. Emmons now owns the entire right and title to the mine, with all water rights and everything else belonging thereto.

GREEN MOUNTAIN MINE.—Every visit to this mine finds it improving in some particular; at present it is looking better than at any former time in its history. The ore now being crushed is all from the No. 5 level and from what is known as the sulphuret ore chute. So far this month but one shipment of bullion has been made; the amalgam for this bullion went as high as $6 per ounce That proves two things; first, that the ore is richer, and second, that the gold is of better quality than for a year or so past.

PLACER.

IOWA HILL.—Placer *Argus*, June 3: The Union quartz mine at Humbug canyon is prospecting quite well Messrs. Neff, E. G. Spencer and two or three others are the owners. The machinery of the Morning Star mine having lately been repaired and set in order, the work of crushing will be begun next Monday.

THE GOLD BLOSSOM.—*Herald*, June 3: The owners of the Gold Blossom mine, located a short distance below Ophir, are pushing work ahead with the view of a thorough development of their property. Besides the work of extracting ore, which is going on all the time, they are putting up crushing and concentrating works, using a hurdy-gurdy wheel for power. This mine has been alluded to in these columns heretofore as the Ohio. It embraces a very large and well-defined ledge, and, so far as prospected, has turned out some very good ore. It is owned mostly by residents of Auburn, and, from what is known, the general impression prevails that they have a good mine.

SIERRA.

MAMMOTH QUARTZ MINE.—Sierra *Tribune*, June 4: The Mammoth quartz ledge, located on Kanaka creek, about 5 miles southwest of Forest City, is owned by Messrs. Way & Spencer. Thus far the average width of the ledge has been from 80 to 110 ft. The formation surrounding the ledge at the footwall is porphyry, and at the hanging wall, serpentine rock. The ledge is entirely decomposed to the depth it has been worked, and the ore prospects well from wall to wall in fine gold. The owners have recently started a new tunnel, which will tap the ledge 200 ft in depth, and, if the ledge continues to pay as well as at present, the owners certainly have a bonanza. A sufficient water power for running any number of stamps can be had from Kanaka creek the year around, which fact, together with the readiness with which ore can be extracted from the ledge, would reduce the cost of reduction to a very low figure, and render it possible to work low-grade rock at a profit.

BRUSH CREEK QUARTZ MINE.—We are informed that the above company will resume operations on its claim, which is located near the Mountain house, the 1st of July. Considerable money has been taken from the mine. After lying idle several years, work was commenced on it last season by the present owners, but, after pumping the mine partially out, the shaft caved, and a suspension of work ensued. The company will erect new hoisting works and sink another shaft.

TO RESUME WORK.—Charles Benham is expected out here from New York the first part of this month, when, we are informed, he will start up work at the Golden Gate, Harlem and Black Jack mines.

PROSPECTING. — *Mountain Messenger*, June 3: The Marguerite Co. will soon start a tunnel at a point near their quartz mill at Loganville, running in the direction of the Keystone mine The company has located all the ledges that crop and has also made a tuonel location which gives it the right to all the blind ledges discovered. The course of the tunnel is south, 20 degrees east, courses magnetic.

THE Bald mountain Co. is employing 120 men. They are over 8,000 ft underground, and near the Ruby line. The gravel lead now being worked is very rich, and pays well. Oscar Jones, day boss, has our thanks for kindly attention shown us the other day, on a ride through the mine.

IMPROVING.—The Marguerite M. Co. is at work putting in 10 more stamps at their quartz mill, at Loganville. They will also put up several more buildings this summer. The mine is proving to be a very good property and improving every foot they go down.

FORT WISE.—Large cave at O. Liberty's hydraulic claim last week, but the debris is about cleaned away, and good returns anticipated for the season.

GOOD HOPE.—Mr. Hewson, the owner of the Good Hope quartz mine, has a force of men at work getting things in order to start the mill. The road and dump are being fixed and some changes made in the mill, which will probably be started this week.

THE hydraulic diggings at Morristown and Craig's flat are paying exceedingly well this season. Two more months of water expected.

SAN DIEGO.

PINACATE.—Los Angeles *Commercial*, May 27: From a reliable gentleman, just arrived from Pinacate, San Diego county, we gather the gratifying information that the camp referred to is in a splendid condition. The poorest quartz and quartzite runs from $30 to $40 per ton in gold. Three mills are crushing the quartz, one of them being a custom mill, which is of the greatest advantage to prospectors, who own rich claims without the capital necessary to erect a mill. We were shown a beautiful specimen of rock, rich in free gold, which assays a fabulous sum per ton. The California Southern railroad is now running two trains each way daily within half a mile of the mines and mills, rendering transportation easy, sure and speedy. From all reliable information that we can gather, Pinacate is destined to become one of the richest mining districts in southern California, which is another feather in our cap, already crowned with similar plumes.

TRINITY.

COFFEE CREEK.—Trinity *Journal*, June 3: Sam Borden, of Trinity Center, was in town this week, and reports everything lively there and thereabouts. On Coffee creek the Nash Deep Gravel M. Co. is running full blast with about 30 white men and 40 Chinamen at work. Their ditch is completed, water through the ditch and sluicing commenced. On the East fork of Coffee creek Rundell & Co. are at work, with good indications of success.

FORGING AHEAD.—Work is progressing satisfactorily on the new Canon creek ditch, under the direction of E. M. Benjamin, superintendent. One and one-half miles of the ditch were graded lu 0 days.

MR. F. T. HAWLEY, superintendent of the Willshire mine, at Big Bar, was in town this week. He reports a short mining season consequent on the dry winter.

NEVADA.

BRISTOL DISTRICT.

DAY COMPANY.—Pioche *Record*, May 27: The hauling of ore and coal to the Day furnace has been steadily going on during the week, and last week G. R. Barton went to Eureka for the purpose of purchasing large coal teams. The same steady work is being carried on in the company's mines, and the Day mine is holding its own.

THE FIRST LOAD.—A 10-mule team, loaded with chloriders' ore from one of our mines, passed down the street on Friday. This is the first load of ore shipped to the Day Co.'s furnace at Bristol from Pioche, preparatory to the starting up.

THE mill of the Bristol Co. is running again, and we hope it will continue so without interruption. We learn that the water supply is better than it has been heretofore.

EUREKA DISTRICT.

ANOTHER TUNNEL ENTERPRISE.—Eureka *Sentinel*, June 1: Notwithstanding the many tunnels that are being driven to pierce the old mountain, the owners of the following-named mines, located on the west side of Prospect mountain, have concluded to consolidate their properties for the purpose of developing them by a deep tunnel, commencing at the Jeff and running easterly through the Tyndal, Cosmos, Mary Ann, Nondescript, Anonyma, Jones & Kyle, Commit, Wolverine and Mountain Pride, connecting with the Sea King shaft, which is being sunk by the Richmond Co.

ITEMS.—Capt. Fuller is opening up a fine ore body on Adams' hill in the Paul Pry mine.....A fine body of ore has just been encountered in the Paul Pry mine on Adams' hill.....The Membres and the Oriental & Belmont mines have commenced shipping ore to the furnaces. .....Two leases have just been let to work the Oriental & Belmont mine, on Adams' hill. Work will be commenced to-morrow.....The Dead Broke mine, on Prospect mountain, owned by Martin Pantoni, is looking well, and has a large amount of high-grade ore to be taken out. .....Mr. John Rettis and Joseph Armstrong yesterday leased the 4th level of the Phœnix mine. They have put the shaft in good order, and will commence mining immediately.....At the War Eagle mine, on Adams' hill, owned by James Slaven and others, a strike of ore has been made that is 2 ft wide and assays from $100 to $125 per ton in gold with a small per cent. in silver .....In the Banner mine, on Prospect mountain, they have a larger body of ore than ever before, and it is of a higher grade than formerly. Twenty tons of the ore will be shipped to the Richmond works immediately. An increased force of miners will be put to work this week. .....It is understood that there is about to be a consolidation of Eureka Tunnel and Eldorado Con. mining companies under the name of the Eureka Tunnel Consolidated Mining Co. An assessment will be levied to pay off the debts of both the old companies. The new enterprise will start up with a fair prospect.

ELLSWORTH DISTRICT.

THE SITUATION.—Grantsville *Bonanza*, May 29: Last Sunday, in company with Wm. Watson, we took a trip over to Ellsworth. The people there are hopeful of enjoying a prosperous summer. The mill is undergoing a thorough repair under the superintendence of Charley Ogden, and when ready will be started up on ore from the Esta Buena mine. Mr. Riley, one of the owners in this property, is at present in Ellsworth taking in the situation. At the Kohinoor, Foreman Garrard is doing some little work. At Marble Falls the mines are looking well, and as soon as the arastra is completed an effort will be made to reduce the ores. Should it work successfuly it will prove a source of profit to its owners as the ore encountered in the mines is of a high grade. Considerable prospecting is being done in Ellsworth with varying success.

ESMERALDA DISTRICT.

HUMBOLDT HILL M. & M. Co.—Esmeralda *Herald*, June 3: Notices have been posted on the streets for the letting of two contracts at the mine—one to sink the north incline shaft 45 ft, the other to run a drift connecting the north and south shafts—pending the completion of which the mill will work on custom ores. To-day a clean-up is being made at the mill for the month's run.

GARFIELD DISTRICT.

ATTRACTING ATTENTION.—Cor. Esmeralda *Herald*, June 3: Garfield District attracts more attention than any district along the line of the C. & C. railroad, and the meritorious showings in the mines at work prove the attention is not ill-bestowed. Johl & McDonald are working about 20 men steadily, and taking out the same good quality of ore from the famous Lottie. They have now about 40 tons on the dump. The tunnel being run to tap the Lottie ledge is now in a distance of 225 ft.- Mead and others have suspended work on the Yerington & Bliss, having encountered ground that requires timbering, and there not being a supply of that necessary article at hand. The reports from the Farrington & Moss mines are very flattering. I understand that they had 40 tons of ore worked from their mine that netted about $20,000. Among the claims that have started work this month is the Black Prince, owned by Box, Hauger and others, which has a favorable outlook. Also the Baby mine, owned by Hawthorne & Hultman, which is looking well. Work has been resumed on the Wm. Eva copper mine about 5 miles southeast of Garfield, with a force of 8 men. At the depth of 90 ft the ledge is 10 to 20 ft wide and runs from 20 to 40 per cent. copper. Report has it that smelting works will soon be erected at Soda Springs for the Wm. Eva. There is now on the dump 500 tons of ore.

LEWIS DISTRICT.

BETTY O'NEAL.—Lewis *Herald*, May 31: The stopes in the Betty O'Neal still hold their own, and the usual amount of ore is being taken out; the ledge increases in size as the drifts and stopes are driven south. A winze has been sunk from the Bateman stope to the lower level in good ore all the way, the ore streak being about 2½ ft. wide. The shaft has been sunk 13 ft to date, and the indications are very favorable for striking a lode of ore The Eagle mill has been kept going steadily on ore from the Betty, and considerable bullion shipped to San Francisco. A clean-up will be made on the 1st of June and the mill shut down for a day or two for necessary repairs. On starting up again arrangements have been made to work a quantity of ore for the Morning Star mine, after which the Betty O'Neal Co. will again supply the mill with ore for reduction.

EAGLE MINE.—About 30 tons of ore have been extracted from one of the old stopes in the Eagle mine by tributers, 15 tons of which is first-class and will work away up; the remainder will, judging from appearance, more than pay cost of extraction and milling. There is considerable good ore yet remaining in the old workings of the Eagle mine, and good wages can be made by leasers.

MORNING STAR.—The track laying and timbering in the lower level is now completed and everything is in first-class order, ready for starting up at a moment's notice. The pack train is running steadily, bringing ore to the wagon road at the forks of Lewis canyon.

EMMA.—Work has been suspended on the Emma mine for the present and will not be resumed till after the return of the owner, J. A. Blosson, from California.

PARADISE DISTRICT.

NEW MILL.—*Silver State*, May 27: A small 4-stamp mill for the Credit Mobilier mine in Paradise district, owned by A. M. Saderns, has arrived at Golconda, and will be taken at once to the mine. Paradise district is situated about 12 miles from Golconda in the range of mountains between the Humboldt river and Paradise valley, and the Credit Mobilier mine, the first found in the district, has produced considerable rich gold-bearing quartz.

WILLOW CREEK DISTRICT.

GOOD PROSPECTS.—*Silver State*, June 3: A note from Willow Creek says there is considerable activity displayed among mining men in that district. The mines increase in size and richness as work progresses and depth is attained. The Emma tunnel is now in 165 ft, and the depth from the surface, at the face of the tunnel, is 125 ft. There is a fine body of ore in the tunnel, and the mine promises to be a veritable bonanza. Work still progresses on the Comstock, and there is a large pile of rich ore on the dump. J. T. Upson has struck a new prospect, which assays well in gold and silver, and promises to be a good mine. The owners of the Ohio mine have put on a force of men, and are opening the mine and taking out ore, with the intention of shipping it to Salt Lake, where nearly all the ore produced by the mine has been shipped at great expense. There is no mill in the district, and it is hard on miners to be compelled to ship ore to have them worked, as only the richest will bear the heavy expense attending shipping. Prospectors are coming into the district daily, and all appear well pleased with the prospects. A 10-stamp custom mill would certainly do well at Willow Creek. It would encourage mine owners to develop their claims, as ores which are now valueless because not rich enough to ship, could then be worked.

ARIZONA.

RUSSELL CAMP.—*Epitaph*, May 27: From Mr. August Joeress, of Russell Camp, who arrived in Tombstone yesterday, we learn that the smelter, recently erected at that point by the Philadelphia company, is running along smoothly and doing excellent work. The smelter was started up on the 16th and made a trial run for 24 hours, and was then shut down for a few repairs. It was started up again on last Tuesday, and since then has been doing some excellent work and turning out bullion at the rate of 6 tons daily. The Hughes Brothers, formerly of Bisbee, are managing the smelter, which, under their able management, is destined to do work. The Philadelphia company own a group of rich mines, of which the Peabody, Copper King, Highland Mary, Dona Ana, and Tam O'Shanter are the principal. A number of miners are employed extracting ore from these, and the management hope that enough ore will be hoisted to keep the smelter in a steady run. The ore is of a high grade, averaging $37 in silver and 60 per cent. in copper.

SILVER KING.—Pinal *Drill*, June 3: This company is making considerable improvements in the interest of economy and convenience. The foundation for a new assay office, above the dump, adjoining the mill, is completed. It will be 30x33 ft, divided into 4 rooms. The old office will be used as a storeroom. Adjoining the new assay office will be a blacksmith and carpenter shop, 40x46. By drifting in the well, they have now secured a supply of water, sufficient for any reasonable number of stamps, so that question is now definitely settled. The working force has been somewhat reduced, by dispensing with superfluous hands. On the 27th ult., the mine shipped four bars, value $7,425 This small shipment was made so as to get the bullion into the San Francisco mint before it closes down for the regular summer clean-up. On Wednesday, 22,468 pounds of concentrations were shipped.

REVIEW.—Tombstone *Epitaph*, June 1: The mining outlook in Tombstone never appeared brighter or gave promise of more brilliant results than at the present moment. The leading claims are yielding more than the average quantities of ore, and the mill results are fully up to the usual standard. The litigation which has impeded the prosecution of work on some of our most valuable mines, has been brought to a close, and operations will be resumed on a larger scale than ever before. With the starting of the Tranquility and the Intervener, several hundred men will be set at work. Thus far the work of development in the district has demonstrated the fact that as depth is reached, the ore bodies improve in size and richness. As near as we have been able to ascertain, the bullion yield for May is fully up to the preceding month, and with the starting up of the Boston Co.'s mill near Charleston, we look to see it largely increased for June. Now that the Huachuca Water Co. have their works nearly completed, it is almost certain that one, or perhaps two new mills, will be erected near town.

COLORADO.

BLACKHAWK.—*Reporter-Call*, May 26: The sampling works of the Miners' Sampling Co. are being reorganized. It is said that the firm of Cochrane & Watson have, or will assume management of the works. The lessees of the Sleepy Hollow mine were hoisting ore this afternoon. The tunnel below the Bull's Head corral, worked last year by Kelly & Co., is to be driven another 50 ft, and connection made with a shaft sunk some years ago for air. Henry Guerney is cleaning up the debris around the old Tomlinson mill, which he is having crushed at the Cashier's 35-stamp mill. He is making good wages for the time occupied, the debris running from 4 to 6 ounces per cord. The down freight train from this place for the valley numbered many cars laden with mill tailings and smelting ore.

DAKOTA.

ABOUT DEADWOOD.—*New Northwest*, May 27: Seth Bullock arrived here last Friday, and is looking after some property interests. He says the old Montanians in the hills are generally doing well, and the quartz mills running prosperously. The Homestake Co., which absorbed nearly everything else in the hills, is capitalized at $10,000,000, and shares of a par value of $100 are quoted at $30, and the company is paying 30 to 40 cents per share dividends monthly. The Deadwood Co., in which G. S. & Co. are heavily interested, pays 25 cents per share monthly. The Belt mines, which a year or two ago were in doubt, are all paying. The Homestake Co., which some 6 or 8 months ago built and completed a railroad 14 miles to Lead City and Elk creek for a wood road, is now extending it to Deadwood and Rapid City, making it 45 miles long, and will carry passengers and freight. The iron is now being hauled in and the cars are being built in Deadwood. Population has fallen off some in Deadwood, but the valleys are increasing in population, and agricultural and stock interests are prosperous. A. J. Simmons is operating the Harney's Peak Hydraulic M. Co He organized the company last year, expended about $25,000 in fitting up for operations, and Mr. Bullock thinks the enterprise will make $100,000 this year.

IDAHO.

PROSPECTORS.—*Idaho World*, May 30: Al Oertz, the newly elected Recorder for Lower Squaw Creek district, was in town this week and dropped around to see us. Al says a crowd of Squaw creek prospectors will go down to Cherry creek, which empties into Payette just below the mouth of Squaw creek, on the hunt of placers, in a few days. It is reported that good prospects were obtained there in early days, and a company was organized to bring in a ditch, but for some reason or other gave it up. The boys say that ground that would even attract the attention of gold-hunters in those days would now come under the head of good paying diggings, and they are going for it, and will soon find out whether there is any truth in the report.

MONTANA.

WALLACE DISTRICT.—Cor. *Inter-Mountain*, May 27: This new camp is located 2½ miles from the line of the Northern Pacific. The Mountain claim is owned by Prof. James House, and shows a 3-ft vein of copper ore. No assays. The Northern Pacific, owned by the same man, shows 4 ft of copper ore. No assays. These two claims have been very recently discovered. The Hidden Treasure is owned by Brent, Milton & Co. The ore body, as developed in the shaft, is 20 ft wide, and assays from $2 to 300 ounces in silver, from $5 to $20 in gold and from 7 to 25 per cent. in copper. The shaft is 40 ft deep. The West Point lode is owned by Richard & Dickenson, the latter being the Missoula postmaster. The latter has a 30-ft shaft showing an 8-ft vein of ore, averaging 42 ounces silver, $10 in gold and and a large percentage of copper. The St. Lawrence is owned by N. Gouin & Co. This lode has a 90-ft shaft with a 10-ft vein, the ore averaging 65 ounces silver, $9 in gold and a large percentage of copper. The Aladine lode is owned by Frank Keim & Co. This lode, developed by a 30-ft shaft, shows 4 ft of ore, carrying gold, silver and copper, but in what amounts I am not advised. There are about 65 locations in the camp, of which the above-mentioned are by far the best. Some of the others may prove good with development, but many of them are worthless. The veins run northeasterly and southwesterly and the formation is granite. An abundant and reliable supply of water is available and the surrounding mountains are densely wooded with the finest kind of mining timber. Prospectors are coming in every day and some very promising locations have been recently recorded.

A VIEW OF MAGINNIS MINES.—Butte *Miner*, May 27: The development of the less notable but not the less valuable mines of Butte furnishes the surest index to the substantial wealth of the camp. Yesterday Wm. McNulty contracted for the erection of hoisting works on the Mannie, a mine situated northwest of the Alice. Mr McNulty is the owner of the Goldsmith No. 2, which has for some time been bonded to the Moultou Co. Turning from this illustration of the worth of the Butte mining district, we encountered E. A. Nichols, who has recently returned from a month's visit among the Maginnis mines and along the Yellowstone. Mr. Nichols is pretty thoroughly acquainted with what constitutes a good mine, or a good prospect, and his opinion of the Maginnis mines is not a bad criterion for people who have heard so much but seen nothing of the wealth of these mines. The shortest route from here to Maiden, the center of the Maginnis district, is via Helena, White Sulphur Springs and the Judith gap, making a total distance of about 270 miles from Butte. He says Maiden is a place of only a few hundred actual inhabitants. There are 300 or 400 miners there and a number of houses which are not occupied, but which were built to enable claimants to hold lots. In regard to the mines of the Maginnis district, Mr. Nichols says he has seen none that he thought better than Butte mines, and that in reality most of the mines were as yet simply prospects, the real value of which no one could tell.

NEW MEXICO.

MINERAL PICK-UPS.—*News and Press*, May 27: Gov. Tabor contracted for 250,000 ft of lumber for his smelting works at Cerrillos station. Boston capitalists who recently visited the Black Range will soon erect a smelter for custom work below Chloride City. Little activity in Oscura mountains, on account of scarcity of water; the camps are 10 or 20 miles from water. A Chicago man contemplates erecting a sawmill and smelter in the Sweepstakes mining district near Las Vegas. Ore carrying ruby silver and assaying $200 to the ton struck in Nick O' Time mine in Hungry Gulch, near Carbonateville, New Placers. Mine recently purchased by a Davenport, Iowa, company. The McGregor and Commercial group of mines at Georgetown consists of four mines, on which 8,000 ft of development work has been done The ore is chloride of silver and mills from 200 to 8,000 ounces to the ton. The San Pedro company, near Golden, have shut down on the smelter and will start up the stamp. The furnaces are not suited to the character of ore to be treated, and new appliances generally are required. There is a large quantity of milling ore that can be worked with great profit.

COPPER.—Number 1 furnace at Paschal is working beautifully. Number 2 furnace will be ready to fire up to-day. The capacity, after the bottoms of the four furnaces are properly set, will be 200 tons per diem. The company will ship a carload of copper early next week. At the Sherman mine, the 100 level has been connected with the main shaft. From this level a winze has been started and will be sunk 100 ft in the contact. The stopes above tunnel level have produced daily about 10 tons of good ore. The average mill pulp for the week has been about $50 per ton. The Valverde smelter of the Bros is now under full blast, and to encourage the miners to open their mines, the company is offering to buy all ores delivered at their works at the following rates, to-wit: Ores running 15 to 25 per cent., $1 per unit; ores 25 to 35 per cent., $125 per unit; ores 30 to 60 per cent., $1.50 per unit. Any good miner having a fair copper prospect should make at the above rates $10 to $20 per day, and at the same time be developing his claim.

GEORGETOWN MINING ITEMS.—Very rich ore has been found to exist in the second, third and fourth levels of the Naiad Queen. The main shaft on this mine is now down considerably over 400 ft on the porphyry wall, and in drifting from the wall into the silurian lime at various depths, it is found to contain streaks and deposits, some of which will no doubt prove to be very extensive and of high-grade ore. The richest ore and largest deposits in the Naiad Queen, as well as in the McGregor and the Commercial mines, appear to be near and under Parapet mountain, and several drifts now extend pretty well under this mountain. Some very rich strikes have recently been made in the Commercial and McGregor, some of which are in what is termed the second level, 18 to 20 ft below the surface of the lime, proving very satisfactorily that ore in large quantities exists all through the silurian lime, which is several hundred ft in depth, and the deep prospecting now going on will no doubt prove Georgetown to be a far more permanent and better camp than has been heretofore even imagined.

UTAH.

THE EMMA MINE.—Salt Lake *Tribune*, June 2: One of the largest mining properties in Utah, the past few years, is that of the Emma mine, located at Alta, Little Cottonwood. From the best data that can be obtained, this mine has produced ore to the value of $5,000,000, and paid to its New York and London owners dividends aggregating $2,800,000. The past few years the mine has not been worked to any great extent, because of various entaglements among claimants; but just now there is a fair prospect of the mine being made to produce largely again. George Cummings, the manager of the property, received a cablegram yesterday from the Board of Directors in London to at once begin the work of mining upon the property on a more extensive scale than has been done lately. The force will be very much augmented within a few days, and we hope to see a very large output of ore in the future. The dispatch indicates that all differences have been settled and that the property is now fully in the hands of the English company.

Our Mountain Lakes.

As the summer heat becomes more and more oppressive, the dwellers in the valleys will flee as birds to the mountains to breathe the clear, cool air, and enjoy the crystal waters girt about by the grand forests of the Sierras. The mountain lakes are the chief centers of resort, and they have a charm peculiarly their own.

We would make special reference at this time to the far-famed Donner lake, which is shown in the engraving on this page. As introductory to his well-known book on the "Fate of the Donner Lake Party," C. F. McGlashan introduces the following description of the lake, which was the scene of their dread sufferings, and the death which brought to many of them release from woes unspeakable.

Three miles from Truckee lies one of the fairest and most picturesque lakes in all the Sierras. Above and on either side are lofty mountains, with castellated granite crests, while below, at the month of the lake, a grassy, meadowy valley widens out and extends almost to Truckee. The body of water is three miles long, one mile and a half wide, and 483 ft. in depth.

Tourists and picnic parties annually flock to its shores, and Bierstadt has made it the subject of one of his finest, grandest paintings. In summer its willowy thickets, its groves of tamarack and forests of pine, are the favorite haunts and nesting places of the quail and grouse. Beautiful speckled mountain trout plentifully abound in its crystalline waters. A rippling breeze usually wimples and dimples its laughing surface, but in calmer moods it reflects, as in a polished mirror, the lofty overhanging mountains, with every stately pine, bounding rivulet, blossoming shrub, waving fern, and—high above all, on the right—the clinging, thread-like line of the snow sheds of the Central Pacific. When the railroad was being constructed, 3,000 people dwelt on its shores; the surrounding forests resounded with the music of axes and saws, and the terrific blasts exploded in the lofty cliffs shadowing the cañons with reverberating thunders, and hurled rugs bowlders high in the air over the lake's quivering bosom.

In winter it is almost as popular a pleasure resort as during the summer. The jingling of sleigh-bells and the shouts and laughter of skating parties can be heard almost constantly. The lake forms the grandest skating park on the Pacific coast.

Yet this same Donner lake was the scene of one of the most thrilling, heart-rending tragedies ever recorded in California history. Interwoven with the very name of the lake are memories of a tale of destitution, loneliness and despair which borders on the incredible. It is a tale that has been repeated in many a miner's cabin, by many a hunter's camp-fire, and in many a frontiersman's home, and everywhere it has been listened to with bated breath.

VIEW OF DONNER LAKE, NEVADA COUNTY

Our mountain lakes are well described in the following paragraph by Prof. John Le Conte:

Hundreds of little Alpine lakes, with their clear, deep, cold, emerald waters, are embosomed among the crags of the Sierra Nevada mountains. Their origin may be traced to the more powerful actions of glacial agencies in past times; in some cases, gorges dammed up by ancient moraines. The streams that now supply these "Gems of the Sierra" are born in the cold, gloomy solitudes of the upper mountain region, amid perpetual snow banks. Many of these charming lakes are nestled in the least-explored portions of the "High Sierra," and have not been mapped or described; nay, some of them have as yet no designating names. They are the reservoirs of melting snows, and some of them—as those near the headwaters of the Yuba—are the sources of summer supply for hundreds of miles of mining ditches. Hence, the existing condition of our topographical knowledge of these wild and imperfectly explored mountain fastnesses renders it impossible to furnish anything like a complete catalogue of the mountain lakes of the Sierra Nevada.

Mountain Lakes of the Sierra Nevada.

NAME.	Max. length in miles.	Max. width in miles.	Approx. area in square miles.	Hight of surface above the sea level in feet.	Max. depth in Feet.	Hight of bottom above sea level in feet.
Gold	4	2	.....	.....	.....	.....
Truckee	3	3	.....	6,804	90	6,814
Eureka	.....	.....	.....	.....	65	.....
Meadow	2	1	.....	.....	180	.....
Donner	2	1	.....	5,964	.....	.....
Washoe	3	2	.....	5,003	.....	.....
Tahoe	21	12	192	6,247	1,645	4,602
Tenaya	1	1	.....	.....	.....	.....

The foregoing table embraces some of the conspicuous lakes embosomed among the crags of that portion of the Sierra Nevada extending from Lassen's peak (lat. 40° 30′) in the north, to Mt. Brewer (lat. 36° 30′) in the south. With the exception of Tahoe, most of them are comparatively small.

These Alpine lakes, with their clear, fresh, snow-fed waters, surrounded by lofty snow-clad peaks, whose slopes are covered with magnificent groves of pine and fir, constitute the most attractive feature in the lesser summit valleys of the Sierra Nevada. The charmingly picturesque character which they impart to the wild and rugged scenery of these mountains has not been overlooked by tourists, poets and artists. But the inaccessibility of most of these "emerald gems" has prevented them from receiving that notice which their exquisite beauties deserve. As civilization penetrates into these mountain retreats, they will become more accessible, and consequently better appreciated by cultivated visitors. The most extensive, as well as the most celebrated, of these bodies of fresh water is Lake Tahoe.

Trips for Pleasure in California.

California is so much of a pleasure resort, as a whole, it is difficult to point out any part of it not worthy of a visit. Still more difficult is it to select that portion pre-eminent over all others for beauty of scenery, salubrity of climate and general attractiveness; and in another column we have arranged a list of the more prominent places, by consulting which the tourist may select which suits him best.

The dimensions of California preclude the possibility of a trip which will include the whole scope of the State. But, as there is no finer country in the world for summer excursions and camping out than this, a jaunt over a portion of it will suffice for most persons. One can, moreover, choose the kind of scenery he prefers, and, to a great extent, the climate also. The moist, cool atmosphere of the coast, the warmer and drier air of the mountains, or the heat of the valley, present a variety difficult to find elsewhere in the same area. In summer we do not need, in our excursions, to count on rainy days. It never rains here during what is known as the "dry season." One can sleep in the open air or in tents for six or seven months in the year without inconvenience. We have before given a general sketch of the more frequented routes of travel, and repeat here much previously said.

Tourists are somewhat apt to think that after they have seen Yosemite, Lake Tahoe, the Geysers, the Big Trees and a few more of the "sights" of the State, they have seen it all. But there are many beautiful spots in California which lie off the routes of travel, which are worthy of a visit. The number of "springs," and other health resorts, has increased greatly of late; and there are now numerous camping grounds, where those who prefer camping out to hotel life will find all the necessary conveniences.

Going south from San Francisco on the peninsula there is a pleasant road from San Mateo over the hills, by Crystal Springs to Spanishtown and Purissima creek, noted for the finest trout in the State, as they are perfectly pure, the creek falling over the cliffs into the ocean. Further on is San Gregorio creek, with its lagoon famous for fishing. There is a hotel here. Then we come to Pescadero, a coast town much frequented in summer and noted for its "pebble beach." The Pescadero and Butano creeks, near by, afford fine sport for the angler. Beyond that is Scott's valley, and then Santa Cruz, the well-known watering place. Between Purissima and Santa Cruz there are numerous creeks other than those mentioned, with plenty of fine hunting and fishing. Camping grounds will be found all along at many points.

Another trip, starting from the city, is to go by the railroad by way of San Mateo, Redwood City, Menlo Park, etc., to Santa Clara and San Jose, the beautiful towns in the Santa Clara valley. From the first, one may branch off to the foothills of the Santa Cruz mountains, where he will find Blackberry farm, Congress Springs and Los Gatos. From San Jose one may go to the famous Almaden quicksilver mines, and in the opposite direction, a beautiful ride is out to Alum rock, on Penitencia creek, and from there up to the summit of Mt. Hamilton, where the Lick observatory is being built. From San Jose, the S. P. R. R. carries its passengers down the valley past Gilmore (from where one may go to the Gilroy Hot Springs), through the San Juan pass into the Pajaro valley, and across to the noted watering-place of Monterey, where the railroad company has erected a magnificent hotel. There is the beautiful bay of Monterey, with its splendid beach running around from Monterey to Santa Cruz. At various points on the line of the beach are hotels, camping grounds, and various accommodations for tourists and campers. Aptos and Soquel are the most prominent points.

Back of Santa Cruz the range of mountains of that name offers a splendid opportunity for camping, fishing and hunting, and there are numerous public resorts and springs, such as Magnetic springs, Wright's and others. The climate in the vicinity in summer is beautiful, and the mountains usually filled with campers.

Following on down the coast, we strike back through the Salina valley to Soledad, and from here may visit the Paraiso springs, seven miles distant. Then continuing on down the valley again we meet the plateau on which is Paso Robles springs, a noted health resort. Then further on we arrive at San Luis Obispo, an old Spanish town surrounded by grain fields and sheep and cattle ranges. Between there and Santa Barbara these ranges prevail. Santa Barbara is on the coast and is usually reached by steamer and not by the route we have mentioned, which is the way one would have to go by wagon.

To see the coast and its towns below Monterey, the best way to do is to take one of the Pacific Coast Steamship Co.'s steamers and go as far as San Diego and, back. In this way Santa Barbara may be visited conveniently. You can also stop at Los Angeles, and by lying over a trip, visit Santa Monica, the orange groves of Los Angeles, and vineyards of Anaheim.

Back from the coast is the charming city of Los Angeles, with its lovely environment. Beyond is San Gabriel valley, with the famous Sierra Madre Villa, popular far and near. By rail eastward one reaches the valley of the Santa Ana, and sees Riverside, a horticultural jewel, with the Glenwood cottages in the midst of orange groves. Beyond is the beautiful San Bernardino valley with the lovely Crafton retreat at its head, the Arrowhead springs, with their medicinal waters and enchanting traditions, and Waterman's hot springs, which have wide fame, but are not now open except for transient visitation.

Returning to the coast one may take the steamer and see San Diego with its magnificent harbor and splendid climate. Returning, as the steamer comes up it passes through the Santa Barbara channel, between the islands and mainland, and coasting along up, finally enters the historic portal of California—the widely famed Golden Gate.

Starting again from San Francisco, as a center, going north along the coast we visit Sausalito and San Rafael, and back of them Mt. Tamalpais, and horne by the North Pacific coast narrow-gauge road, we pass through a beautiful country, up along the shores of Tomales bay, passing on the way Paper-mill creek, Taylorsville, and many beautiful camping spots; then on through the redwood timber to Duncan's mills and the Russian river, famous for its beautiful scenery.

Then again by a route ending at the same place, one may go to the S. F. & N. P. R. R. to Donahue, Petaluma, Santa Rosa (where you leave for Mark West springs), to Healdsburg, on the Russian river. From here Litton springs, Skaggs' springs, the world-famous Geysers, etc., may be visited.

A beautiful trip is up through the fine vineyards of the Napa valley, where are hosts of summer resorts. In this county many pleasant summering places are established in the neighborhood of Napa City, St. Helena, Calistoga, Kellogg, and other places. Among the well-known resorts are the Napa Soda Springs, Litton Springs, Nook farm, Sulphur springs at Calistoga, Etna Springs, near Pope valley; Sulphur Springs ranch, near Knoxville, and Petrified Forest.

Entering Lake county from the west, the Highland Springs is the first resort reached by stage from the railroad station at Cloverdale. From Ukiah to Lakeport by stage, the Blue lakes and the Pierson Springs are approached. Entering the county from the south, by stage from Calistoga, the traveler passes Mt. St. Helena, and can take a magnificent view from the summit by tarrying at the Mt. Toll House, and take a short horse-back ride. Anderson Springs, Harbin Springs, Glenbrook, Adams' Springs, Siegler Springs, Howard Springs, Soda Bay, on Clear lake; Sulphur Banks and Borax lake, Mound cottage, Bartlett Springs are among the notable attractions of Lake county. Lake county seems admirably and wonderfully adapted for a universal tourists' field, and is some day destined to attain a world-wide reputation.

Shasta county, from the well-watered bottom lands of the upper Sacramento valley up to the refreshing Strawberry valley, at the base of Mt. Shasta, some 70 miles or more, is a pathway full of joy to the hardy tourists who delight in rugged walks of nature. The United States fish-hatching establishment on McCloud river and Soda springs, clear fishing brooks and rivers, good fishing, etc., are here met with.

In Contra Costa county, the view from the summit of Mt. Diablo, on a clear day, is grand and wonderful in the number of cities and towns embraced in the vast extent of populated territory brought within the scope of the tourist's vision. A Byron, in this county, are hot sulphur springs which are lately becoming quite noted. The Piedmont springs in Alameda county, back of Oakland; the hay baths at Alameda; the sulphur springs in Colusa county; the White Sulphur springs near Vallejo, in Solano county; Webber lake, Donner lake, and hosts of other attractions, might be mentioned.

In Calaveras county, six miles from Knight's Ferry (Stanislaus county), are the Lane springs.

A warm and remarkably dry climate is found, early and late in the season, on the western borders of the Sacramento and San Joaquin valleys, which is remarkable for its sanitary qualities, which seem specially kindly and favorable in many localities to sufferers from pulmonary afflictions.

The whole range of the Sierras, which extends the length of the State, abounds in magnificent scenery. It would take more than a page of our space simply to mention the points of interest. At different points in the range and the foothills, hydraulic and quartz mining are carried on extensively, and those who have never seen the former should visit at least one gravel mine while in California.

It is, of course, impossible, in a brief article, to enumerate all the pleasure and health resorts of California, or all the thousand and one places where people go to amuse themselves in the summer months. We shall, in future issues of this journal, take occasion to mention other than those spoken of here. Every little canyon and glen, every mountain valley, every nook has its picturesque points, known to a chosen few. Here and there are places more widely famed. The vineyard regions of one section, the orange orchards of another, the wheat fields of another, possess charms to allure people of different temperaments. Others, again, prefer the solitudes of the hills, where the unbroken forests reign supreme, where they can retire for a time from the busier scenes of life.

Prospecting for Water.

There is a good deal of talk about boring artesian wells in the eastern part of the State at various points, but as yet no one seems to have actually commenced the work. A dispatch from El Paso, Texas, says the Southern Pacific railway builders sunk an artesian well to the depth of 700 ft., in the neighborhood of Fort Quitman, and found streams of flowing water. At Ven Horn, on the Texas and Pacific railroad, another artesian well has been dug, and water found at a depth of 500 ft.

All this should encourage our people. It is almost positively certain that flowing wells may be had everywhere in our valleys, surrounded as they are on all sides by high ranges of snowy mountains.

Another and still better proof that flowing, and even spouting, wells may be obtained, provided the well-borer has coin and courage to go to a sufficient depth, is the fact that everywhere in Nevada the flowing springs are found near the tops of, or on the highest ranges of mountains and hills. All old prospectors know that when suffering for water on the deserts, it is useless to look at and about the mouths of ravines and canyons for water. The traveler must follow up the first big canyon he reaches, and at the head of this, on the top of the highest mountain, he will soon find springs and grass. Nearly everywhere the water of the springs sinks after flowing a short distance down the canyons.

Strangers are astonished at finding all the springs of this country on the highest ridges of the hills, it being just the reverse of what is seen in most places in the Eastern and Western States. However, when the geological formation of the country is carefully examined, it is easy to see how this happens. The tops of the hills and mountain ranges are the edges of strata that have been heaved upward from great depths by volcanic or other convulsions of the earth, and the water is forced up through these breaks, which is its only outlet to the surface. Were the streams that supply these springs topped by wells bored in the valleys, it is easy to see that the water would spout up with great force.—*Virginia Enterprise.*

WAGES IN OREGON.—The following is from a circular of the Oregon Railroad and Navigation company, in answer to one of many questions propounded by intending immigrants: Farm labor, $1 a day and board; harvest work, $1.50 a day. On the Sound wood-choppers earn from $60 to $90 a month. All good hands find work on railroads at the following prices: Common laborers, $1.75 to $2 a day; foremen of gangs, $75 to $100 a month; blacksmiths, $2 to $4 a day; carpenters, $3.50; tracklayers, $2 to $2.50; team and driver, $4.50. These figures are intended to apply to Willamette valley, and are equally applicable to southern Oregon. In Jackson and Josephine counties a good many hands are employed in placer mining, the wages generally being $1.50 a day and board.

DISTRICTS AROUND LUNING.—A letter from this region, on the Carson & Colorado railroad, says: Luning may be said to be the base of supplies for four mining districts. Silver Star district lies almost directly north; New Boston, the once lively camp, on the south; Santa Fe, a promising mineral region, on the east, and the last becoming familiar district of Garfield on the west. The latter is plainly visible from the town, though situated eight miles away in an air line. Piles of ore, in sacks and ready for shipment, are stacked about the platform at the depot, giving the place an air of permanency, from a mineral-producing standpoint.

A SUCCESSFUL PULVERIZER.—The Winnemucca *Silver State* says: "J. V. McCurdy, a practical millman of 20-years' experience, has been experimenting with one of Hoyt's ore pulverizers at the Bullion of Paradise mill. He says they proved beyond doubt that a machine three feet in diameter will grind, with one-fourth the power required for stamps, 25 tons of ore in 24 hours. The machine grinds it finer than it can be crushed in a battery."

THE new flumes of the Cal. W. & M. Co., at Frazer flat, near Greenwood, El Dorado Co., were completed Wednesday, May 24th. They have a capacity of 2,000 miners' inches, are five feet on the bottom, three feet on the sides, and 28 feet high at the highest point, with an average hight of about 12 ft. The aggregate length of the three flumes is about 1,400 ft., and 59,000 ft. of lumber were used in their construction, which had to be hauled a distance of eight miles.

THE corner stone of the Denver mineral exposition building has been laid by Gov. Pitkin, in the presence of several thousand people. An eloquent oration was delivered by T. M. Pattarson and an address by Judge W. S. Decker. The occasion was made a partial holiday by business men and citizens. A large force of men is actively employed on the building, which insures its completion in time to open the exhibition Aug. 1st.

AT Blackfoot, Idaho, there are teams enough to take all goods for Wood River as fast as they arrive. Up to the present, 2,000,000 lbs. of Wood River and Salmon River freight have been sent forward. The roads are in good condition now, and the stages are carrying all the passengers, mail and express without any delay whatever. Travel over the road is very large at this time.

USEFUL INFORMATION.

To Take out Milk and Coffee Stains.

These stains are very difficult to remove, especially from light-colored and finely finished goods. From woolen and mixed fabrics they are taken out by moistening them with a mixture of one part glycerine, nine parts water, and one-half part aqua ammonia. This mixture is applied to the goods by means of a brush, and allowed to remain for 12 hours (occasionally renewing the moistening). After this time, the stained pieces are pressed between cloth, and then rubbed with a clean rag. Drying, and if possible, a little steaming, is generally sufficient to thoroughly remove the stains. Stains on silk garments which are dyed with delicate colors, or finely finished, are more difficult to remove. In this case five parts glycerine are mixed with five parts water, and one-quarter part of ammonia added. Before using this mixture it should be tried on some part of the garments where it cannot be noticed, in order to see if the mixture will change color. If such is the case no ammonia should be added. If, on the contrary, no change takes place, or if, after drying, the original color is restored, the above mixture is applied with a soft brush, allowing it to remain on the stains for six or eight hours, and is then rubbed with a clean cloth. The remaining dry substance is then carefully taken off by means of a knife. The injured places are now brushed over with clean water, pressed between cloths and dried. If the stain is not then removed, a rubbing with dry bread will easily take it off. To restore the finish, a thin solution of gum arabic, or in many cases beer is preferred, is brushed on, then dried and carefully ironed. By careful manipulation these stains will be successfully removed.

How to Make Brick Walls Water-Tight.

The Sylvester process was successfully applied to the interior walls of the gate-houses of the Croton reservoir in the Central park in this city, in 1866, on the advice of the late William Dearborn, C. E., and under the immediate supervision of George S. Greene, Jr., C. E., now the engineer-in-chief of the department of docks.

The process and its results in this case are described fully by Mr. Dearborn in a paper read by him before the American Society of Civil Engineers, May 4, 1870.

The process consists in using two washes or solutions. The first composed of three-quarters of a pound of castile soap dissolved in one gallon of water, laid on at boiling heat with a flat brush. When this has dried, 24 hours later apply in like manner the second wash of half a pound of alum dissolved in four gallons of water. The temperature of this when applied should be 60° to 70° Fahr. After 24 hours apply another soap wash, and so on alternately until four coats of each have been put on. Experiments showed that this was sufficient to make the wall water-tight under 40 ft. head of water.

At the time of application the walls had been saturated and the weather was cold. The gate chambers were covered over and heated thoroughly with large stoves. The drying, cleaning the walls with wire brushes, and applying the mixture, took 96 days. Twenty-seven tons of coal were used for the drying, and one ton for heating the soap solution. Eighteen thousand eight hundred and thirty square ft. of wall were washed with four coats. The drying and cleaning of the walls cost six and a half cents per square ft., and the plant, materials, and labor of applying the wash cost three and three-eights cents per square ft.

TO EVICT RATS.—A writer in the *Scientific American* says: "We clean our premises of the detestable vermin, rats, by making whitewash yellow with copperas and covering the stone and rafters with it. In every crevice in which a rat may go we put the crystals of the copperas and scatter in the corner of the floor. The result was a perfect stampede of rats and mice. Since that time not a footfall of either rats or mice has been heard around the house. Every spring a coat of yellow wash is given the cellar as a purifier, as a rat exterminator, and no typhoid, dysentery, or fever attacks the family. Many persons deliberately attract all the rats in the neighborhood by leaving the fruits and vegetables uncovered in the cellar, and sometimes even the soap is left open for their regalement. Cover up everything eatable in the cellar and in the pantry, and you will soon starve them out. These precautions, joined to the services of a good cat, will prove as good a rat exterminator as the chemist can provide. We never allow rats to be poisoned in our dwelling. They are so apt to die between the walls and produce annoyance."

TO MAKE STENCIL INK.—A good and cheap stencil ink, in cakes, is said to be obtained by mixing lamp-black with fine clay, a little gum arabic or dextrin, and enough water to bring the whole to a satisfactory consistency.

A ROAD locomotive for war purposes, lately tried, weighed 28½ tons, and drew easily 40 tons' weight of guns mounted on their carriages, fully equipped. Its maximum traction power is 150 tons, and its cost of maintenance is about 30 cents an hour.

Cutting the "Key Log."

The first thing to be done is to find out where the jam occurred, and then to discover what is called the "key log," that is to say, the log which holds the base of the "jam." An old experienced "stream driver" is soon on the spot, for the news is soon carried up stream that there is a "jam" below. Every minute is of consequence, as logs are coming down and the "jam" increasing in strength. The "key log" being found, there is a cry for volunteers to cut it. Now, when you consider that there are some hundred big logs of timber forming a dam, and the instant the key log is cut the whole fabric comes rushing down with a crush, you will see that unless the axe-man gets instantly away, he is crushed to death. There are usually in a camp plenty of men ready to volunteer; for a man who cuts a key log is looked upon by the rest of the loggers just as a soldier is by his regiment when he has done an act of bravery. The man I saw cut away a log which brought down a whole jam of logs was a quiet young fellow, some 20 years of age. He stripped everything save his drawers; a strong rope was put under his arms, and a gang of smart young fellows held the end. The man shook hands with his comrades, and quietly walked out on the logs, axe in hand. I do not know how the loggy-road one felt, but I shall never forget my feelings. The man was quietly walking to what very likely might be his death. At any moment the jam might break of its own accord, and, also, if he cut the key log, unless he instantly got out of the way, he would be crushed by the falling timber. There was a dead silence while the keen axe was dropped with force and skill on the pine log. Now the notch was near half through the log; one or two more blows, and a crack was heard. The men got in all the slack of the rope that held the axe-man; another blow, and there was a crash like thunder, and down came the wall of timber, to all appearances on the axe-man. Like many others, I rushed to help haul away the poor fellow; but, to my great joy, I saw him safe on the bank, certainly sadly bruised and bleeding from sundry wounds, but safe.—*The Field.*

GOOD HEALTH.

Infant Food.

There are about 20 European preparations styled infant foods, and at least twice as many American, all of which profess to furnish complete nutrition for the infant during the first few months of its existence, while yet the conversion of starch into dextrine and sugar is beyond the capacity of the untrained digestive function. The examination of these with a microscope, assisted by such simple tests as iodine, which turns starch cells blue, and gluten (or albuminous) granules yellow, has engaged the careful attention of Dr. Ephraim Cutter, of Cambridge, and his reports will startle most mothers who have relied upon the extravagant pretenses set forth by the circulars of manufacturers. Eliza McDonough, who preceded Dr. Cutter in this field, has been in a measure discredited; but it appears that her assertion—that the starch, so far from being transformed into dextrine, was not sufficiently altered to render the recognition of its source difficult, whether from wheat, corn, rye or barley—was strictly true, and that these pretentious foods are, without exception, nearly valueless for dietetic purposes. All of them consist of baked flour, mainly, either alone or mixed with sugar, milk, or salts. In some cases, the baking has been very inadequately performed, and the doctor found one that consisted merely of wheat and oats whose starch cells were proximately in their natural condition. The general result of Dr. Cutter's examination may be stated in brief terms as follows:

There was scarcely a single one of the so-called infant foods that contained a quantity of gluten as large as that contained in ordinary wheat flour. That is to say, a well-compounded wheat gruel is superior to any of them, particularly when boiled with a little milk; and others are in error who place the slightest dependence upon them. As respects one very expensive article, professing to possess —— parts in every 1,000 of phosphatic salts in connection with gluten, Dr. Cutter was unable to find any gluten at all. The thing was nearly pure starch, sold at an exorbitant price for nerve and brain food, and a great remedy for rickets. So all through the list. Sometimes a trace of gluten was present; more frequently none at all. In one case, there were 90 parts of starch to 10 of gluten; but this was exceptional, and the majority were less valuable, ounce for ounce, than ordinary wheat flour. Considering the pretensions that have been put forth by the manufacturers of these foods, some of them sustained by the certificates of eminent physicians, the report of Dr. Cutter is one of the dreariest comments upon human nature that has recently fallen under the notice of the journalist. But if the revelation he has made of fraud and pretense on the part of manufacturers in this field will serve to protect mothers from further betrayal, and to rescue infant life from quack articles of nutriment, his work, though giving a tremendous shock to our sensibilities and to our faith in medical certificates, will not have been done in vain.—*New York Times.*

The Cause of Bright's Disease.

What is the cause of so much Bright's disease? asks a victim of this malady. To which we reply, there are many causes. One is the taking of a cold. A cold may go to the kidneys as well as the lungs, and do a great deal more harm there, for the tubules in this organ are very multitudinous and very minute. When inflamed they suffer in the same way that the nasal and bronchial tubes do; that is, get catarrh. A slight inflammation of these tubules is called a catarrhal one; but when it becomes deeper seated, then it is called croupous. About the only difference is one of degree, not of kind. Another cause of the disease is the excessive use of flesh food, and of hot, stimulating spices and drinks. Lager beer, it is said, is a frequent cause of Bright's disease. Alcoholic drinks, we know are. Many medicines are said to cause it, as, for instance, chlorate of potash, used so freely in many diseases; and it would not be at all strange if it was also caused by the use of the various baking powders so much in vogue. A person suffering from this malady should lead a sober and careful life, live on a plain, unstimulating, but nutritious diet, take moderate exercise, avoid lean meat, or use it only sparingly, and keep the skin active, so as to relieve the kidneys as much as possible from work. In its first stages, its ravages may be stayed, and, if the constitution be a good one, the person may live to a good age. In its worst form there is no remedy of much avail. Those advertised by the quacks, and, we are sorry to say, those given by the doctors, are of about equal worth, and both are valueless.—*Herald of Health.*

PERSPIRATION.—The amount of liquor matter which passes through the microscopic tubes of the skin in 24 hours, in an adult person of sound health, is about 16 fluid ounces, or one pint. One ounce of the 16 is solid matter, made up of organic or inorganic substances, which, if allowed to remain in the system for a brief space of time, would cause death. The rest is water. Beside the water and solid matter, a large amount of carbonic acid (a gaseous body) passes through the tubes; so we cannot fail to see the importance of keeping them in perfect working order, removing obstructions by frequent applications of water, or by some other means. Suppose we obstruct the functions of the skin perfectly by varnishing a person completely with a compound impervious to moisture, how long will he live? Not over six hours. The experiment was once tried on a child in Florence. Pope Leo X., on the occasion of his accession to the papal chair, wished to have a living figure to represent the Golden Age; so he gilded a poor child all over with varnish and gold leaf. The child died in a few hours. If the fur of a rabbit or the skin of a pig be covered with a solution of india-rubber in naphtha, the animal ceases to breathe in two hours.

RELATIVE SAFETY OF ANÆSTHETICS.—Dr. Ormshy, of the Meath Hospital, Dublin, has compiled the following table of the absolute and relative mortality caused by the use of the leading anæsthetics. The table is based mainly on statistics gathered by Dr. Andrews, of Chicago, and Dr. Richardson, of London:

Agent Employed.	Deaths.	Admins.	Deaths.	Admins.
Ether	4 in	92,815,	or 1 in	23,204
Chloroform	53 in	152,260,	or 1 in	2,873
Mixture of chloroform with ether	2 in	11,170,	or 1 in	5,585
Bichloride of methylene	2 in	10,000,	or 1 in	5,000

HOT MILK AS A RESTORATIVE.—Milk that is heated to much above 100° Fahr. loses from the time a degree of its sweetness and its density; but no one fatigued by over exertion of body and mind who has ever experienced the reviving influence of a tumbler of this beverage, heated as hot as it can be sipped, will willingly forego a resort to it because of its having been rendered somewhat less acceptable to the palate. The promptness with which its cordial influence is felt is indeed surprising. Some portions of it seem to be digested and appropriated almost immediately; and many who fancy they need alcoholic stimulants when exhausted by labor of brain or body, will find in this simple draft an equivalent that shall be abundantly satisfying and more enduring in its effects.

PEPSINE IN SEA-SICKNESS.—A note in the *Pharm Zeitung* states that pepsine has been taken in about 20 cases by travelers who had never made a previous voyage, and has proved quite successful in warding off sea-sickness. As much pepsine as will lie on the point of a knife is dissolved in a wine-glassful of water containing five drops of hydrochloric acid. This dose is taken three times a day, and especially if feelings of sea-sickness threaten. Finzelberg's pepsine is especially named as having been used.

THE ELECTRO-MAGNET.—The question—"What constitutes the strength of the electro-magnet"—is answered through the *Scientific American*, as follows: The magnetic strength of an electro-magnet depends upon the size of the iron core, the number of turns of wire surrounding it, and the strength of current charging the wire of this helix. In practice these helices are seldom wound to a diameter exceeding three times the diameter of the core, as what is thereby gained in magnetic moment is more than lost in increased resistance of helix circuit.

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SAN FRANCISCO:
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Passing Events.

The accident which occurred at the Alta mine on the Comstock, with its tragic story of impending death, suspense, attempts at rescue, and final saving of lives by the heroic exertions of fellow miners, two of whom lost their lives in their bold endeavors, is one which has carried a thrill of excitement through the mining community. The details of the affair we give in another column. To the men who so bravely risked their lives in the attempt to save their fellow men, all unite in doing honor. The memory of those who died while performing this duty will be kept green in the hearts of their fellow men.

We record also in this number of the PRESS the death of Prof. W. Frank Stewart, of Nevada, a man well known in mining circles on this coast.

The rush to Wood river and Butte still continues, and both places will soon be overcrowded, no doubt. Maginnie district, Montana, also attracts many, but its isolation prevents any but men with means from going there. Doubtless new regions will be discovered by the hardy prospectors in their wanderings this summer.

SECRET CANYON.—The Eureka *Leader* says From Secret canyon we learn that the outlook for that camp is more than usually favorable. The chutes at the mill are full of ore ready for crushing, and the dump at the mine is overflowing with high-grade ore. A miner who has resided in Secret canyon for the past nine years, and who is familiar with the ore extracted from the Geddes and Bertrand in its palmiest days, states that the rock now being taken out is far superior to any that has ever been seen in that section of the country.

Bureau of Mines and Mining.

The plan has been repeatedly brought forward to establish a bureau of mines and mining, similar in scope to the Department of Agriculture, in order that the Government should assist the mining interests of the country in some substantial way. Although frequently urged, it is only of late that any decided move was made toward bringing it officially before the Government. A bill was introduced, however, this session of Congress, providing for the establishment of a bureau of mines and mining. This bill we gave in full at the time of its introduction. The House Committee on Mines and Mining, to which this bill was referred, has considered the matter and reports that the United States Geological Survey is, to all intents and purposes, practically a bureau of mines and mining, and that all the legislation that is needed is to enlarge somewhat its jurisdiction.

This action of the committee will probably end the matter for the present. It is sincerely to be hoped, however, that the agitation of the subject will result in the United States Geological Survey paying some attention to the *practical* part of the mining interests.

What we mean is this: While the survey is working up the general geology of the country, describing its topography, scenery, etc., let a branch of it be at work collecting information which will be of practical service to the miners in their every-day work. General geology is all very well for a scientist, but it will not tell a miner anything about how to make his rock pay. The Agricultural Department not only makes experiments, but raises seeds and sends them to different people in different sections to try for themselves. It is not necessary for the survey to make experiments, but it can report upon and record the results of the work of other people. If a man is working a peculiar ore in a peculiar way, let the officials so report in their volume, so other miners elsewhere can get the experience.

There is nothing impracticable in this. One of the most valuable contributions to metallurgical knowledge extant is the report on mining industry issued by Clarence King's U. S. geological exploration of the fortieth parallel. It was written by James D. Hague, and described the mining and metallurgical appliances and the processes in use on the Comstock, besides giving a large amount of general information. This work is still an authority, though published in 1870, and long since out of print.

Why should not the Government now tell the miners what improvements have been made since then? Why should it not describe the smelting processes, lixiviation processes, gold mining appliances, and methods of copper mining, lead mining, etc.? These are the things miners want to know about. They have a very slight interest indeed in a lot of catalogued minerals and rocks that to them represent no economic value. Abstract geology interests them not at all. As to finding mineral, an old prospector could "give points" to the most learned writer of works on geology; and it is mineral we want to find.

The fact is, there is too much science given us. Science is very well, of course, and necessary; but it should not crowd out the bread and butter feature. Is it not more important to tell a miner how to work ore that he has, than to tell him, for instance, about the "Birds of the Colorado Valley," or "Ethnography and Philology of the Hidatsa Indians," or the "Geology of the Henry Mountains." All these things are very well and very good, but they do not cover the practical ground that the mining community would appreciate.

The mining community is not scientific. It is eminently practical in every sense. Its principal need of science lies more in the direction of metallurgy than any other. It is there the miners want applied science. As far as mere mining is concerned, science has not made an unquestionable record. Its mistakes have been so many and so frequent that what are known as scientific miners are in bad odor. Theories borne out by results in one district are totally upset in another, and this lack of uniformity, and the evil results attendant on the acceptance of reports based upon false premises, have weakened confidence to a great extent.

But if record is made by the Government of what men have accomplished, and are accomplishing, with the different appliances and processes, or practical information is gathered which men can apply to their own cases, then the utility of the Survey will be more promptly recognized by the mining part of the community, and it will never have difficulty in obtaining appropriations. There are plenty of men fit for the work; it needs only a step in the direction indicated to bring about valuable results.

THERE are many rich mines north of the Elk Range mountains, Montana, and near the headwaters of Musselshell river. Some of them are being worked with great assidnity, while others are still undeveloped, awaiting the arrival of the iron horse to make them valuable. Copperopolis, in this district, contains the famous copper mines. The Barker section contains the camps known as Gold Run, Hugher City, and Meagher City.

THE Copper Queen now yields 13 tons of ingot copper daily.

Blasting with Lime.

A new method of mining coal has, for several months, been in operation at the Shipley collieries, in England. These mines are fiery, and the use of powder had been prohibited, owing to liability of accident. Therefore the arduous system of breaking down the coal by wedges had to be adopted to provide a method of coal getting such as would avoid accident. In consequence, however, of the substitution for blasting by powder of the more costly process of wedging, the owner of these collieries was placed at a considerable commercial disadvantage with others working the same seam as that at Shipley, who still continued the use of gunpowder. Many systems were tried by which it was hoped the coal could be more economically got, and the numerous accidents constantly happening from wedging avoided, but without success. Nearly two years ago experiments were commenced by some of the officials at these collieries with a view to practically utilizing the power of lime, which, when concentrated and used in a confined condition, produces successful results; while the process has for its recommendations safety, simplicity and economy.

The present mode of operating is to employ lime in a specially caustic state, made from mountain limestone. This is ground to a fine powder, and consolidated by a pressure of about 40 tons into the form of cartridges two and one-half inches in diameter, having a groove along the side. These are then packed into air-tight boxes to protect them from damp, and are ready to be conveyed to the mine for use. The cartridges are made by hydraulic power in a press specially constructed for the purpose, which can be erected at a small cost at any colliery. The shot-holes are first drilled by means of a light boring machine, and an iron tube, about one-half inch in diameter, having a small external channel or groove on the upper side, and provided also with perforations, is then inserted along the whole length of the borehole. This tube is enclosed in a bag of calico, covering the perforations and one end, and has a tap fitted on to the other end. The cartridges are then inserted and lightly rammed, so as to ensure their filling the bore-hole. After the cartridges have been enclosed by tamping, in the same way as with gunpowder, a small force-pump is connected with the tap at the end of the tube by means of a short flexible pipe, and a quantity of water, equal in bulk to the quantity of lime used, is forced in. The water being driven to the far end of the shot-hole through the tube, escapes along the groove and through the perforations and the calico, flowing towards the tamping into the lime, saturating the whole of the charge and driving out the air before it. The tap is then closed, so as to prevent the escape of the steam generated by the action of the water on the lime, and the flexible pipe attached to the pump is disconnected. Experience has shown that after introducing the water there is always an interval before the steam attains a high pressure, so that all danger can be avoided. The action of the steam first takes place, cracking the coal away from the roof, and this is followed by the expansive force of the lime. The pressure of steam generated by the usual charge of seven cartridges, as employed at Shipley, is 2,850 lbs.

To demonstrate the power contained in these cartridges, Mr. Paget Mosley, of London, recently exhibited to a society of mining engineers two pipes which had been burst by lime cartridges used in the same way as in a shot-hole in the coal. The one broken into small pieces was burst at a lecture given by Prof. Abel at the Royal Institution, on April 28th, last. The piece not broken showed that the force was not exercised in throwing out the tamping if properly rammed. That piece—the larger—was previously tested by water pressure to a strain of 953 lbs. per square inch without bursting, that being the limit of the testing power employed. The thicker pipe was burst at Shipley collieries, it being thought unsafe to try an experiment with a pipe of such strength in a lecture-room. The time occupied in drilling a hole three feet deep and two and three-fourths inches in diameter, inlnding setting up the drill, averages 12 minutes; charging a hole with cartridges and tamping up, four minutes, and pumping in the water, one minute; thus effecting a considerable saving of time, as compared with drilling, charging and tamping a hole for gunpowder. The sprage are left in under the coal so as to allow the force to exert itself as far back as possible, and in many instances the coal is forced off and falls for a distance of several inches behind the end of the drilled holes. In ten to 15 minutes, on the removal of the sprags, the coal falls clean from the roof, in large masses ready for loading, practically making no small. If all the sprage are removed at once, the entire length of coal operated on falls; but the collier can, if more convenient, remove two or three sprage at a time, and let down as much as he requires for loading, leaving the rest to remain spragged up till wanted. In places with bad roofs this is especially advantageous. To show comparative results, experiments were made, and it was found that 140 tons more coal were obtained with 100 hours less labor by the use of the lime patent than by wedging.

Smelting Rich Silver Ores.

In the last number of the PRESS we gave a paragraph on "Roasting Silver Ores in Mexico." This described briefly the preliminary process to the smelting. This smelting process, as stated last week, is only applied to richer silver ores, by far the larger proportion being treated by the patio process. The fusion of the roasted ors is effected in a small blast furnace having, according to John Arthur Phillips, the following dimensions: Hight to the charging hole, four feet, six inches; depth from the front to the back wall, 15 inches; width at top, 11 inches, and at bottom only about nine inches. This is, of course, a very small furnace, but is one any miner can build. It is one he can make money with, too, provided his ore is rich enough.

The aperture through which the fused materials make their escape is about two and one-half inches in diameter, and is situated at the bottom of the furnace, whilst the copper nozzle through which the blast is supplied is placed about nine inches above it. The breast, which is built of fire-stone, is taken down whenever the furnace becomes choked, or when it is found necessary to re-line the interior with a fresh coating of refractory clay, which is usually required at the expiration of a week from the time of first getting the apparatus into blast.

In front of the furnace, and below the aperture through which the various fused matters make their escape, is a breast pan 10x13 inches, in which they accumulate, and from which the lead and other fused matters are, from time to time, tapped into a basin, situated at a still lower level; while the slags are removed from the breast pan whenever any portion of them becomes sufficiently solid.

The blast is supplied by bellows, set in motion by cams, fixed in a horizontal axle connected, by toothed gearing, with a vertical shaft, to which a mule is attached. A couple of these furnaces are usually built side by side under a hood of masonry, open at the top for the escape of metallic fumes and the products of combustion. In front of each is a series of bins containing the ores to be smelted, which are mixed in various proportions with the different fluxes employed. The fuel made use of is, in most instances, charcoal, prepared either from pine or green oak.

This furnace, which was first introduced into the country by the Spaniards, and appears to have undergone but little modification during the last three centuries, is that still almost universally employed in the different native establishments, although furnaces on the model of those used in the metallurgical works of the continent of Europe have replaced them in the larger haciendas, conducted under the superintendence of Europeans.

The ore, after having been previously roasted, is placed in hutches before the furnaces, from which it is taken to be mixed with the various fluxes and furnace products constituting a charge.

The campaign of a blast furnace begins on the Sunday evening, and extends to the morning of the following Sunday, at the expiration of which time the bad quality of the materials employed renders it necessary to suspend operations for the purpose of making repairs. After getting the apparatus into blast, 300 lbs. of lead ore are first passed through it, and of which the yield of metal is not calculated in the results obtained. As soon as the preliminary charge has been fused, the mixture of ore and fluxes is thrown into the furnace, with alternate charges of charcoal, as often as its contents descend sufficiently below the level of the charging hole.

The smelter, who has charge of two furnaces, takes care to keep the eye constantly open, and for this purpose frequently introduces an iron bar, with which he gently raises the slags and fuel which occupy the lower portion of the apparatus; he also attends to the proper regulation of the blast, and the proportion of fuel to be employed. When a sufficient amount of lead to form an ingot has accumulated in the breast pan, the blast is stopped and the eye of the furnace is closed by a plug of clay; after which the dam, between the breast and receiving basins, is pierced, and the fused metal and matte are allowed to flow into the latter, when the eye of the furnace is again opened, and the operation continued until enough lead to yield another ingot has been produced.

As soon as the contents of the tapping pan have become sufficiently cooled, the mattes are removed from the surface of the bath of lead, and at once passed through the furnace with the next charge, after which the metallic lead is ladled into a convenient mold. The foreman is assisted during this work by a man who charges the two furnaces, and by another who attends to the preparation of the mixture of ores and fluxes; he is relieved every 12 hours by another smelter and his assistants.

The quantity of charcoal consumed during the production of an ingot of metal varies from 50 to 75 lbs.; and from eight to twelve are produced in the course of 24 hours, according to the nature and richness of the ore treated. When the minerals operated on contain a considerable amount of lead, each furnace will sometimes smelt as much as a ton of roasted ore in the course of 24 hours, with a consumption of about 55% of charcoal; but such results can only be obtained under very favorable circumstances.

Production of the Precious Metals.—No. 12

[An abstract of the Census Monograph on the bullion output of the country.]

This large amount is absorbed mainly in the following principal industries: The manufacture of jewelry, plate, and plated ware, and articles of *vertu;* watch-case, gold pen, instrument, and spectacle making; dentistry; gilding; photography; and to a less extent in glass staining and in various chemical processes. In addition to the leading uses enumerated, there are many others, insignificant individually, but in the aggregate demanding a considerable supply of the precious metals.

Bullion Produce of the World

The world's annual output, so far as ascertainable, is shown in the following tables, which state the sources according to political divisions, and also by continents. The data are for calendar years, except for the United States, British Columbia and Japan. Accurate statistics of the small production of gold and silver in Central America, that of silver in Canada, and gold in Nova Scotia and not available. The totals given are probably slightly under the actual amount. A comparison of the individual figures shows that the United States produce 33.13% of the gold yield of the whole world, 50.54% of the silver, and 40.91% of the total. Of the aggregate supply of the precious metals, North America (including the United States, Mexico and British Columbia) furnishes 55.78%.

Annual Bullion Product of the World—Political Distribution.

Country.	Gold.	Silver.	Total.
	Dollars.	Dollars.	Dollars.
United States*	33,379,633	41,110,957	74,490,620
Mexico	969,161	25,167,763	26,150,924
British Columbia†	910,804	.....	910,804
Africa	1,993,800	.....	1,993,800
Argentine Republic	78,540	420,235	498,771
Colombia	4,000,000	1,000,000	5 000,000
Rest of South America‡	1,993,800	1,039,190	3,032,990
Australia§	29,018,223	.....	29,018 223
Austria	1,062,031	2,002,727	3,004,758
Germany§	205,301	6,938,073	7,143,434
Norway	.....	166,270	166,270
Italy§	72,375	17,949	90.324
Russia§	26,584,000	415,676	26,999,676
Sweden	1,994	62,435	64,429
Rest of Europe	.....	2,078,380	2,078,380
Japan	406,548	916,400	1,382,948
Total	100,756,300	81,336,045	182 092,361

*Census of 1880 †Actual export. ‡From Dr. Soetbeer's estimate in 1875. §Estimated from production of other years.

Annual Bullion Product of the World—Continental Distribution.

Continent.	Total bullion product.	Percentage of total product.
	Dollars.	Per cent.
North America	101,558,348	55.78
Africa	1,933,300	1.10
Australia	29,018,223	15.93
Europe, including Russia in Asia	39,607,271	21.75
Japan	1,382,948	0.76
South America	3,531,701	4.68
Total	182,092,351	100.00

The census monograph upon the precious metals will be accompanied by a series of lithographic plates, containing charts showing the distribution of the product of the United States and of the world, and the annual fluctuations in the yield of the country from 1848 to the close of the census year.

An Improved Chair Brace.

A recent invention, patented through the Mining and Scientific Press Patent Agency, and one which is deserving of meritorious notice, is the chair brace of Mr. John A. Gallagher. This is shown clearly in the accompanying cut, by reference to which the utility of the device may be seen. Chairs receive more or less rough handling, especially those known as bar-room chairs. The result is that in a short time the legs are loosened in their sockets and the arms and back grow insecure, the whole chair becoming rickety and unsafe. Wire braces of all kinds have been tried, but none are found effective, besides generally presenting a bad and uncouth appearance. Mr. Gallagher uses four rods or wires, secured under the seat of the chair and to the lower portion of the legs, all the wires converging to the center of the space under the chair. Upon these are two discs or plates, which are adapted to approach to or recede from each other by means of a thumb-screw or bolt. Their separation tightens all the wires equally, and such power is gained that the legs may be firmly bound together to strengthen and brace the chair. To brace the arms and back, other wires descend therefrom, and are secured to the upper portions of the wires underneath. The separation of the actuating plates draws inward their wires, which movement draws downward upon the back and arm wires, thus, by one operation, tightening up the entire chair. The device does not detract from the appearance of the chair, and, at the same time, is so simple and effective that it must be regarded of value in preserving a chair long beyond the usual term of its use.

Imprisoned Miners.

Grave Danger and a Heroic Rescue.

On Wednesday, the 31st ult., the main pump column in the Alta mine, on the Comstock, was broken. Men were at work making the necessary repairs, when, at 11 o'clock, the bulkhead recently placed in the main east drift on the 2150 level gave way. This bulkhead was constructed of plank and timbers, and was placed in a part of the drift where the rock was hard and perfectly solid. It would seem that it at first gave way at one end, as the first rush of water was not very alarming, though it was thought best for all to get off the level. Three or four men, who were near the shaft, went up, and Richard Bennett, the shift boss, at once started out into the main west drift to notify the men at work at that point of the danger. About the time he started on his errand it would seem that the whole bulkhead went down, and there was a tremendous rush of water.

This drift is 1400 ft. long, and the last seen of Bennett was when he started in on his errand of mercy. At the face of the drift six miners were at work, whose names are as follows: P. Denney, Malachi Curran, T. McDonald, John Black, John Mulligan and Morris Connere. The drift was run with a raise of about one foot in each hundred, therefore, at the face it would be 14 ft. higher than the floor of the station at the shaft. This circumstance gave some hope of being able to save the seven men who were imprisoned. Every possible effort was made to keep the pump going at best speed, but there were over 2,500 ft. of drifts in the level to be emptied.

It was found that the men were tapping on the compressed air pipe as a signal of their existence. A boat for navigating the drift was made, but it was too high. Another boat, made of canvas and used for gunning purposes, was lowered into the mine. All the time the bailing tanks and pumps were kept at work all day Thursday and Friday. During this time the excitement was, of course, intense. Two men, George Gorneet and Anthony Smith, tried to penetrate the drift, but had to return.

At four o'clock on Friday morning the water was so far lowered that it was thought the boats could venture in. William Bennett, a nephew of Richard Bennett, the shift boss, and Denis Callahan took the canvas hunting boat belonging to Fred Ritter, the gunsmith, and the flat wooden boat, constructed at the mine, and ventured into the drift. They had placed in the boats ice, water and some refreshments, and hoped to be able to force their way in to the end of the drift. They pulled out into the drift and that was the last seen of them alive. It appears that they started off without the knowledge of Superintendent Boyle or John Hosking, the foreman, who had not intended that the venture should be made at that time. It would seem that the two men were very anxious to reach their friends, and supposed the air was no worse at any point ahead than near the mouth of the drift. Both these men died.

We condense from the Virginia *Enterprise* a very exciting account of the incidents:

A Man in Armor Penetrates the Drift.

In the afternoon, about three o'clock, when the water in the month of the drift had been reduced to about three feet, John Van Dusen entered the drift. He had on him an apparatus invented and constructed by Andrew Peasley, of this city. This armor consisted of a mask for the face, from which there was a rubber-breathing tube passing into a tin box strapped on the man's back, which box was filled with fragments of ice and perforated with holes to allow of air passing in through the pounded ice. Wearing this armor, Van Dusen struck boldly into the drift.

He was gone about half an hour, when those at the station heard a call for help. Men went in the direction of the cry, and when out about 100 ft. from the shaft found Van Dusen in an exhausted and fainting condition.

As soon as Van Dusen was able to converse he said that he had found the seven men originally imprisoned in the drift alive and all right. He said they were in the cooling-off house, about 100 ft. from the face of the drift. With picks or bars they had broken the pipe carrying compressed air and had then so bent it as to carry the end into the cooling-house. In this house, when they were first imprisoned, they had nearly a barrel of ice water. When this was exhausted they poured into the barrel hot water from the drift. Then they twisted the end of the compressed air pipe down into the water in the barrel, and allowed it to exhaust there. This rendered the water quite cool and drinkable. They had a light in the cooling-house, but nothing to eat. The great heat rendered them weak and feverish. Mr. Van Dusen told the men he would inform their friends that they were all right, and assured them that a host of brave men were outside doing all that could be done by human beings for their rescue. As his ice was fast melting away, Mr. Van Dusen could not remain long with the men; besides he was anxious to get out and give notice of their being alive and of their situation. It was owing to the consumption of the ice in the box at his back that Mr. Van Dusen came near losing his life. There being but a few lumps rolling about, much hot and foul air entered his armor, whereas, had there been the proper quantity all the air entering the mask must first have been cooled and purified by coming in contact with the fragments among which it passed.

The Rescue.

That evening, about seven o'clock, six men entered the drift and, at the risk of their lives, pushed their way through to the cooling-house. They carried with them some milk punch and some ice. They found the men about as described; indeed, the six men were in a worse state when they reached the cooling station than were those they found in it. However, they recovered on reaching the fresh air sent in by the compressor.

GALLAGHER'S PATENT CHAIR BRACE.

The men in the cooling-station tried to persuade the new arrivals to remain and take their chances with them instead of venturing back. This, however, they dared not do, as it would have left their friends on the outside in doubt as to their fate, and would have caused great uneasiness. Though the six men had seen the bodies of Bennett and Callahan, while on their way in, they thought it best to say nothing about their having lost their lives.

Work was then pushed on with great vigor on the air pipe, and at length a current from the blower was sent through its whole length. This gradually forced out the belt of foul air.

The men about the mine became so exhausted by about nine o'clock last night, that they sent up from the mine to superintendent McKenzie, of the Sierra Nevada, to send down a fresh force from his mine.

Meantime the air had so far improved that the imprisoned men could be visited. By the advice of the physicians they were given stimulants and refreshments, and kept in the cooling-house to get some strength before an attempt was made to bring them out. The men told their visitors that they had at no time been much alarmed for their ultimate safety. They said that before the accident happened they had frequently talked about what they would do in case of the bulkhead giving way, and had concluded it would be best to remain in the upper end of the drift and wait for the water to be pumped out.

When the men were all safely out of the drift, the Alta whistle began a prolonged scream, and this was taken up all along the lode. It was kept up for about five minutes, just as in case of fire in the early days, and for a time the whole country was made to howl. The only drawback to the general joy was the sad fate of the two brave men, William Bennett and Denis Callahan. It is saddest of all, to find how unnecessary was the noble attempt and the willing sacrifice they made.

It is said that the scenes that occurred at the shaft when the men were brought up and restored to their wives, children, relatives and friends were such as no pen could describe. Among all the spectators present there was the wildest excitement. In this city, when the whistles sounded the signal that the men were at last saved after their imprisonment of some seventy hours, people rushed out into the streets and shook hands right and left, and were so full of joy that they could hardly speak.

New Ore Feeder for Stamp Mills.

In the crushing of ore by means of vertically-moving stamps in a battery, it is necessary for the most efficient work that the ore should be kept at a certain depth upon the dies, not decreasing, so that the stamps shall fall upon the dies; nor increasing, so that the quantity shall impede the fall of the stamps or their efficient action by its depth. This feeding is best effected by some automatic device so connected with the stamps that it will be actuated by their rise and fall, and regulated by increasing or diminishing amount of ore beneath them. It has hitherto been effected by means of inclined shaking or rotating tables placed beneath a hopper, so as to receive the ore from it and carry it to the battery, or by revolving cylinders beneath the hopper, having pockets which receive a certain amount of ore from the hopper and carry it forward and discharge it into the battery. These methods are open to some objections, especially when the ore is wet or sticky.

Isaac N. Templeton, of Amador, Cal., has just patented through the Mining and Scientific Press Patent Agency, a form of ore-feeder which is constructed somewhat different from those in use. His invention contemplates the employment of a chute or hopper having a bottom so inclined that ore or other material would flow downward upon it by gravitation, and having a front with a slide, by which the flow of the ore may be regulated, the principal weight of the ore being supported upon the incline bottom. At the lower end of this chute, and outside of the hopper itself, is mounted a smooth cylinder, lying horizontally across the end of the chute and turning upon a shaft. This cylinder is so mounted with relation to the inclined bottom of the chute that the latter would, if convenient, pass just above the center of the axis, so that the one is checked by the upper part of the cylinder, while its tendency is to move forward and discharge whenever the cylinder is rotated. In order to cause this gate or check to rotate and allow the ore to flow when required, a flanged pulley is secured to one end of its shaft, to be operated by a clutch. This clutch consists of an arm having slide-pieces bolted to or formed with it, and bent or fitted to clasp the edges of the pulley.

The clutch is loosely connected with a vertical rod, the upper end of which is attached to a horizontal lever-arm. This arm extends to a point near the stamp-stem, by which it is to be operated, so that a tappet upon the stem will strike the end of the arm at each fall of the stem, until the amount of ore within the mortar is sufficient to raise the stamp so high that the arm ceases to act. The tappet, striking an arm, operates the clutch, which impinges upon the pulley, giving the latter a partial rotation, which causes the feeding from the hopper or chute of a quantity of ore. Upon the upward stroke of the tappet the arm will be released and the clutch allowed to assume its original position, without affecting the pulley or cylinder, ready to repeat the former operation when the tappet makes a downward stroke. By means of a screw, or other device connecting sections of the rod together, the action of the clutch can be varied, so as to control the feeding action of the cylinder. This is effected by turning a sleeve or nut, which will lengthen or shorten the rod, and consequently affect the normal position or relation of the clutch to the pulley of the cylinder.

By this mechanism it will be seen that a sensitive feeding apparatus is secured, because the instant the ore in the battery falls below a certain point the lever-arm will be struck by the tappet, and the clutch is so accurate in its action that it will turn the wheel and cylinder by the smallest possible movement. This is an advantage over a pawl and ratchet, as the movement of the latter is effected only at prescribed intervals, or when the action of the lever or arm is great enough to move the pawl the distance between two teeth of the ratchet.

The clutch has side pieces capable of adjustment by slots and bolts, to permit the application of its jaws to the rim of the pulley of the cylinder.

The cylinder has no wings, scrapers, pockets, indentations, or any attachment or device by which it serves as a feeder, but is intended, and acts, only as a gate or stop for the ore upon the chute, from which it would naturally flow by gravitation alone. By being placed with one-half its diameter below the plane of the bottom of the chute, the pressure of the ore is against its upper half and in a line above the shaft on which it turns. This makes it easy to turn, and when turned, it overcomes the friction on the cylinder and slight cohesion of the ore particles which prevents the mass from moving when the cylinder is stationary, and thus allows the ore to feed itself to the battery.

Cylinders having corrugations or depressions to receive ore from a mass within a hopper have been employed to feed furnaces, and such compartment cylinders have also been used with a pawl and ratchet to feed ore to a crushing mill, said cylinders being placed directly within or beneath a hopper, so as to receive a considerable weight of the ore. The objection in such cases lies in the force necessary to separate the ore in the depressions of the cylinder from the superincumbent mass above, and to carry it forward out of the hopper. Moist ore will also stick in the depressions and will not be discharged at all.

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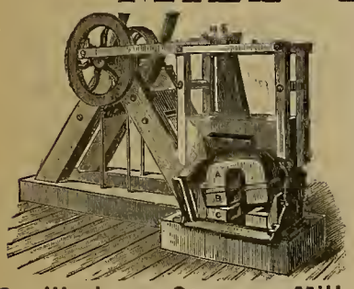

Oscillating Stamp Mill.

Is has no Stems, Cams, or Tappets, and adjusts itself to the wear of the Shoes and Dies.

For simplicity, economy, durability and effective working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power. Awarded First Premium and Medal at Mechanics' Fair, S. F., 1880.

Manufactured by

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Improved Patent Grinding and Amalgamating Pans, Concentrators and Gold Amalgamators; also, Steam Engines and Mining Machinery of all kinds. Send for circulars.

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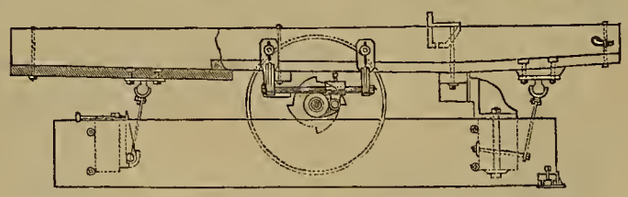
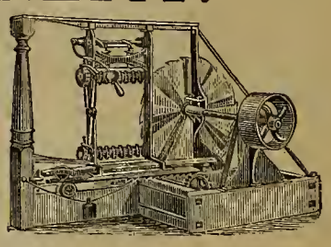


PATTEN'S CONCENTRATOR.

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

☞ Send for Circulars. ☜



SHINGLE MACHINE.

For simplicity, durability and rapidity of action, these Machines have no equal, cutting from 3,000 to 4,000 per hour They are now used by all the principal Millmen on the Pacific Coast.

SAWMILL MACHINERY,

Of all descriptions made to order.

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THE CALIFORNIA POWDER WORKS.

MANUFACTURERS OF

Sporting, Cannon, Mining, Blasting and

HERCULES POWDER

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 XX) is the Strongest Explosive Known.

No. 2 is superior to any powder of that grade.

PATENTED IN THE UNITED STATES PATENT OFFICE.

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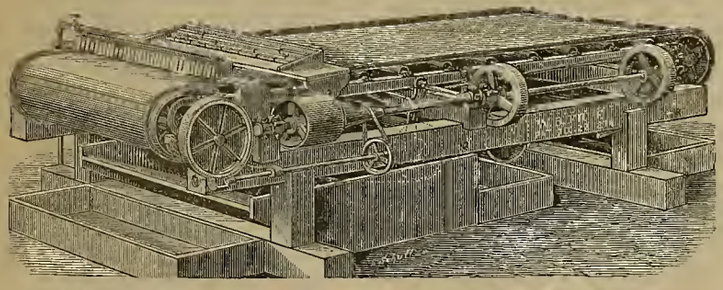


THE FRUE ORE CONCENTRATOR.

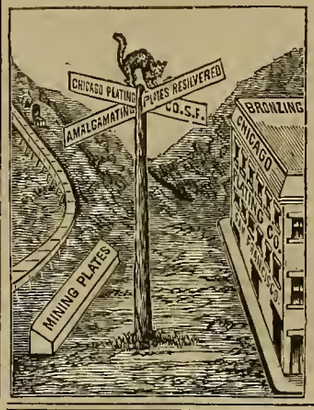
Nearly 300 are now in use, giving entire satisfaction. Awarded First Premium and Silver Medal at the Industrial Fair for 1880 of the Mechanics' Institute of San Francisco, Cal.

Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.

We challenge any other Concentrator in use for a fair and impartial competitive trial, side by side, for stakes of $1,000 each, and we mean business.

☞A machine with all improvements can be seen in working order and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont street.

ADAMS & CARTER, Agents, Room 7 No. 109 California Street, S. F.



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REPLATED OR MADE TO ORDER BY THE

CHICAGO PLATING CO.

Pacific Power Building, 23 Stevenson St., S. F.,

And 261 & 263 Randolph St., Chicago.

Having opened a branch house in S. F., the largest Plating and Polishing Establishment on the Pacific Coast, with all the latest improvements in machinery for plating in Gold, Silver and Nickel, with 12 years' experience in the Eastern States and Europe, we claim that our Silver Plated Amalgamating Plates are the most economical, durable, and successful Plates on the Pacific Coast for saving gold. Every description of metal goods plated in the most durable manner by the

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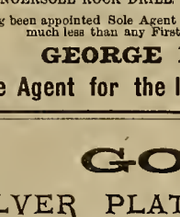
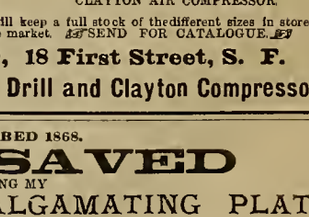
CLAYTON AIR COMPRESSORS,

—AND—

INGERSOLL ROCK DRILLS.



INGERSOLL ROCK DRILL.



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ESTABLISHED 1868.

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SILVER PLATED AMALGAMATING PLATES.

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Ores Worked by any Process.
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THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand

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The Best Low Grade Explosive in the market. Superior to Black or Judson Powder.
VULCAN NOS. 1, 2 AND 3,
The best Nitro-Glycerine Powders manufactured. Having secured large lots of the best imported Glycerine at low prices, we are prepared to offer the mining public the very strongest, most uniform and best Nitro-Glycerine Powder at the very Lowest Rates.
SPECIAL INDUCEMENTS IN PRICES.
Vulcan B B Powder (in Kegs or Cases) is Unequaled
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Caps and Fuse of all Grades at Bottom Rates.
The Central and Southern Pacific Railroads Use Vulcan Powder and no Other.
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S. HEYDENFELT, - - President.
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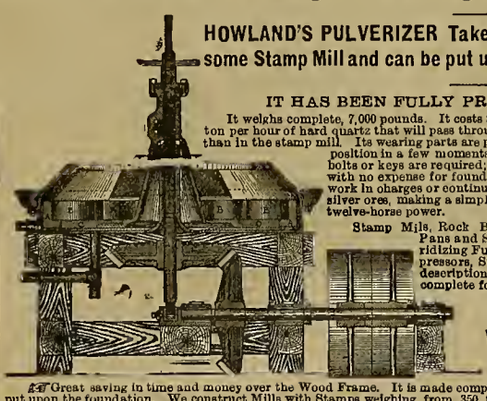
MOREY & SPERRY.
MANUFACTURERS OF
Gold and Silver Grinding and Amalgamating Machinery



HOWLAND'S PULVERIZER Takes the Place of the Cumbersome Stamp Mill and can be put up in one day ready for work.
IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt. Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill. It requires twelve-horse power.
Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver ores Chloridizing Furnaces, Retorts, Rock Drills Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill supplies Iron Work complete for Wood Frames, also
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☞Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
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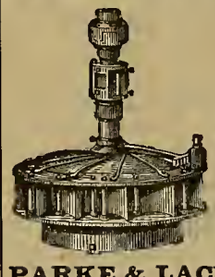

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THE MOST PERFECT TURBINE NOW IN USE.
Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
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STEEL CASTINGS
FROM 1-4 TO 10,000 lbs. WEIGHT.
True to pattern, sound and solid, of unequaled strength, toughness and durability.
An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over other Steel Castings.
CRANK SHAFTS, SHOES, DIES and GEARING specialties.
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SELBY SMELTING and LEAD CO.,
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Gold and Silver Refinery And Assay Office.
HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
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☞Agent for PADDOCK'S Ore Dressing Machinery. Mining Machinery supplied.

San Francisco Cordage Factory.
Established 1856.
Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
Extra sizes and lengths made to order on short notice
TUBBS & CO.,
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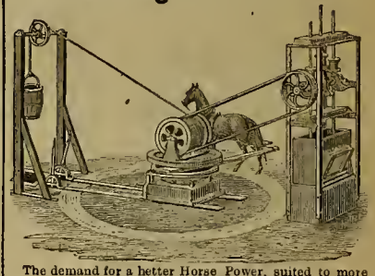
New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
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Containing 672 Pages and 83 Engravings,
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PRICE—bound in cloth, $10.50; in leather, $12.
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MINING ENGINEER and METALLURGIST,
Parral, State of Chihuahua, Mexico,
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Mines examined, reported on and superintended in any part of Mexico. Will buy or rent good mining property.
FOR SALE.—Several groups of good mines in State of Durango. 1,450,000 acres ranches.
Terms Moderate.

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING MAY 30, 1882.

258,562—GUIDERAIL FOR ROPE RAILWAY CLUTCHES—Chas. S. Drake, S. F.

258,563—ATTACHMENT FOR WIRE ROPE RAILWAYS—Chas. S. Drake, S. F.

258,564—APPARATUS FOR COVERING SLOTS IN CABLE RAILWAYS—Chas. S. Drake, S. F.

258,645—CABLE POWER WHEEL—Egbert D. Haven, Albany, Oregon.

258,860—REVERSIBLE SHIRT—David Lubin, Sacramento, Cal.

258,861—ENVELOPE—David Lubin, Sacramento, Cal.

258,661—FIRE BRICK COMPOUND—Edward A. Martin, Virginia City, Nev.

258,679—REIN HOLDER—R. E Shannon, S. F.

258,682—ICE MACHINE—Geo. W. Stevens, S. F.

258 763—GRATE FOR STOVES AND RANGES—Thomas Kearns, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

ICE MACHINE.—Geo. W. Stevens, San Francisco. No. 258,682. Dated May 30, 1882. This invention relates to ceatain improvements in apparatus for refrigerating or ice making of that class in which ethereal fluids are used, and it consists principally in certain details of construction, embracing traps by which the inventor is enabled to free the refrigerating liquid from certain impurities which will collect in it in time; and also a means for agitating or breaking up and distributing the liquid as it flows from the condenser to the freezer, so that the expansion and consequent refrigeration will be more rapid and more equal. It further relates to a means for increasing the surface over which the liquid is spread and for thawing out the pipes when frozen up.

REIN-HOLDER.—Richard E. Shannon, assignor one-half to A. T. F. Ohermeyer, S. F. No. 258,679. Dated May 30, 1882. This invention relates to a new and useful horse-holding attachment for vehicles of that class in which the motion of the wheel is caused to wind up and draw upon the reins through intermediate gearing. This patent covers improvements upon a previous one granted to the same inventor, and consists simply in a novel intermediate mechanism, whereby the motion of the vehicle is caused to wind up the reins.

FIRE-BRICK COMPOUND.—E. A. Martin, Virginia, Nevada. No. 258,661. Dated May 30, 1882. This is a new and useful composition of matter suitable for and forming a fire-brick. The constituents are such as to form a first-class fire-resister.

Gold in California—An Early Record of its Existence.

EDITORS PRESS:—As respects the first knowledge of gold in California, I here give you an unwritten history which antedates the reputed discovery of 1848; which it is well to recite, or otherwise it will he as facts floating in the air.

When I tell you I knew of gold in California in 1845, you will wonder why I was not among the very first to venture hitherward and to-day he crowned with the glory of its grand development. You may also wonder why these statements should remain so long unpublished. Now for the facts: In 1845, with other young adventurers, I visited the Lake Superior copper region, and soon took up with the excitement, and became interested in several companies. As superintendent of the Massachusetts Mining Co., working in Point Kerneshenaw, was an Englishman by the name of Cleme—Capt. Cleme, as we called him. Capt. Cleme, previous to going to Lake Superior, was

A Gold Miner in Brazil.

This fact made him to me a very interesting man, for gold mining, even in my youth, was my grand idea of all industrial pursuits. My youthful ambition was to he a gold miner; and how for 33 years I have labored over the field of my hoyish inspiration the people of this coast well know. Sometimes, as I look back to the beginning and through the intervening years, I say, truly "there is a divinity that shapes our ends," and that we often build wiser than we know—that we are mersly instruments conforming to an unfathomable law, and as laborers in the treadmill of universal progress.

About the 1st of November, 1845, I expected to leave Lake Superior for my home (St. Louis, Mo.), by the last trip of the only vessel at that time on the lake; but as luck would have it, a great storm came up, which prevented my going in a small boat as I had intended, to the point of embarkation some five miles distant. Rather than he left myself, I concluded to leave my haggage, and started through the wood on a run in hopes of reaching the vessel before her departure. But what was my sorrow on reaching Copper Harbor, to find the craft off and just beyond hailing distance. Left! Left! to be buried up in snow and solitude for five long months at least. It was a sad reflection. As fate so decreed, I finally concluded to make the most of the situation, and determined on spending my time in the study of mining, and gold mining particularly, and that Capt. Cleme would he my tutor.

Capt. Cleme's quarters and mine were some 20 miles apart. Still, on snow-shoes, we, about every week, exchanged visits. It was a wild, weird, snowy, uninhabited country, save the isolated mining camp. At all of our meetings, gold mining was the interesting topic. The iron, lead, silver and copper came in, necessarily, for some of our attention. How well do I remember his explanations as to how gold was found, reduced, washed and saved by hides, sheep skins with hair turned up, riffles, etc.

It was at one of our meetings the Captain spoke of gold in California—upper California. He said he believed it to he a great gold country; that he knew gold was there, as he had seen it—the gold brought to Brazil by native Californians, who told him they got it in upper California. This fact fired my brain, and from this time on, the Captain having some maps of the country, I took up the study of California—how to get there, etc.

I was bound for California as soon as I could get away in the spring. My enthusiasm for the venture soon kindled a corresponding one in the Captain's mind, and he, knowing I could command capital and influence for the venture, framed out an expedition. I at once opened correspondence, detailing everything, with my friends in Boston. Letters, at this time, had to he carried to Green Bay, Wisconsin, some 300 miles, on the backs of Indians wearing snow-shoes; and, of course, it took a long time to get answers. Finally, an answer came. The project was warmly entered into by my friend Bernard and his friends in Boston, among whom, if my memory serves me right, was Henshaw, Ward & Co.

The arrangement was: $10,000 was to back the venture; four persons were to compose the expedition, and they were Capt. Cleme, Almarin B. Paul, Joshua Childs (then of the Copper Falls Co.) and a young man of Green Bay, Wis.—I forget his name. All were then at Lake Superior. As soon as navigation opened in the spring, we were to go to Boston, mature our plans and get to San Francisco by some vessel up for the Pacific, or that could he induced to go. So far, all was propitious.

Well do I remember the plans laid, and how queer sounded the names of Rio de la Americanas (American river), Rio de la Plamas (Feather river), Yuha and Sacramento. How we were to reach San Francisco (Yerba Buena) was the undetermined question. Once there, we were to procure a boat, in which we would journey up the hay and the Sacramento to the American river, and on this river commence the search for gold—not finding it (which we would have done), we were

To Croee Over the Country

To the Yuba and Feather rivers and explore them before the search was to he given up.

It was a well-laid plan; I can see now how well, as I have traveled our route many times. The Captain evidently had (as he impressed me) unquestionably reliable data for his guide, as well as the fact of gold. The only dark cloud that hovered over our mind was the talk of war with Mexico, California being then a Mexican province. No mail had been in for a long time, so this question was an unsettled one. This, however, was finally solved; war was declared. The first vessel up, arriving the latter part of April, brought us, I believe, the first news, and as a consequence our expedition had to be abandoned. I now concluded not to return to St. Louis until fall, and spend the summer prospecting for copper along the lake shore. In one of my trips I fell in with a young lawyer from St. Lonis, "away on a lark," full of dash and daring. He suited me to a T. We soon became "chums," when I proposed that we get a birch-bark canoe, a half-breed guide, and start for St. Lonis via the head of Lake Superior, cross over (carrying our canoe) to the headwaters of the St. Croix; go down the St. Croix to the Mississippi, and down the Mississippi to St. Louis. This was no sooner proposed than accepted. This was in 1846, and to cut a long and romantic journey short, we made the trip, meeting on it hundreds, I may say thousands of Indians. But to get back to our subject.

When the Newe Came,

In October, 1848, of the discovery of gold in California (I read it in the *Missouri Republican* at the breakfast table), I at once said, I am bound for California; I know it is all true, and told how I knew it. From that hour on I made business lively to enable me to get off, and it seemed the harder I worked to that end, the more difficulties came up to prevent it. I got ready to start in December, 1848, when a failure stopped me. Again in February, 1849, and a like difficulty arose.

By this, having lost so much time, I now concluded to take out a stock of goods, and bought out an entire establishment of building hardware, packed my goods, arranged for their shipment, and

Started In April, 1849,

Via the plains. No sooner was I well started some 200 miles beyond St. Joe, when an express messenger overtook me, informing me that parties with whom I had left the goods had failed, and I must at once return or lose all. I returned, but to find the principal had decamped after only one interview. Getting a clue to his route, I started after him, overhauled him, forced his return to St. Louis, got my goods and started for New Orleans. It was now about the first of June, but no steamer for cargoes, so I took a sailer, in hopes of reaching Panama for the Orsgon's trip; arrived in due time, but the Oregon had run on a rock and would he laid up for probably two months. All these set-backs made me wild almost. I thought I never would get to California. When I arrived in Panama I found several hundred awaiting passage. A lot of us got together and chartered the whale ship *Eugene*, which floated on so leisurely that it was the 3d of November, I believe, before the hopes of 1845 were realized in 1849. I now stood

Upon the Golden Shores

Of California, where my golden dreams could be realized. I was happy then in being here, and have been ever since.

Of the four adventurers, Capt. Cleme, Joe. Childs and your humble servant all came. When they reached California I do not now remember. Joshua Childs I saw in Sacramento in 1850. Capt. Cleme was then up on one of the rivers. Our Green bay friend had passed on to that land where gold is as drosa (as it ought to be here). So ends my history.

This is the third time I have written this up—once about 23 years ago, again about 15 years ago. Why it was not published I do not know. It was not, and now will it be? Time may obliterate the general interest in the first knowledge of gold in California, and yet it is one of the links in the chain of historical facts which make up correctly the beginning and ending of States, countries and empires for time's great book of records. ALMARIN B. PAUL.

San Francisco, Cal., June, 1882.

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Guadalupe Silver Mining Company—Lo-

cation of principal place of business, San Francisco, California. Location of Works, Urique, State of Chihuahua, Mexico.

Notice is hereby given that at a meeting of the Board of Directors, held on the 28th day of April, 1882, an assessment (No. 29) of Fifty dollars ($50) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 109 California street, Room No. 13, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the fifth day of June, 1882, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the third (3d) day of July, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. WM. BLACKWOOD, Secretary.

Office—No. 109 California street, Room No. 13, San Francisco, Cal.

Gaudalupe Silver Mining Company—Lo-

cation of principal place of business, San Francisco, California. Location of Works, Urique, State of Chihuahua, Mexico.

NOTICE—There are delinquent upon the following described stock, on account of assessment No. 28, levied on the 28th day of April, 1882, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Certificate.	No. of Shares.	Amount
Lee, R. B (estate of)....19		2	$100.00
Steptoe, E. J.....27		1	50.00
McPherson, J. B. (estate of)43		1	50.00
Haynes, T. J. (estate of)...20		2	100.00
Haynes, T. J. (estate of)...90		1	50.00

And in accordance with law and an order of the Board of Directors, made on the 28th day of April, 1882, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the company, room 13, No. 109 California street, San Francisco, California, on Monday, the Third (3d) day of July, 1882, at the hour of 2 o'clock, P. M., of said day to pay said delinquent assessments thereon, together with the costs of advertising and expenses of the sale. WM. BLACKWOOD, Sec'y.

OFFICE—Room 13, No 109 California street, San Francisco, California.

Norwich Gold and Silver Mining Company.

Location of principal place of business, San Francisco, California. Location of Works, Glencoe Mining District, Calaveras County, California.

Notice is hereby given, that at a meeting of the Board Directors, held on the 5th day of June, 1882, an assessment, (No. 1) of Twenty cents (20c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 310 Pine street, room 15, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of July, 1882, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 31st day of July, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. A. L. PERKINS, Sec'y.

Office—310 Pine St., room 15, San Francisco, California.

ASSESSMENT NOTICE.

Gould & Curry Silver Mining Company.

ASSESSMENT, NO. 42.

Levied.....May 23, 1882
Delinquent.....June 29, 1882
Day of Sale.....July 20, 1882
Amount per Share.....Fifty Cents per Share

ALFRED K. DURBROW, Secretary.
Office—Room 29, Nevada Block, 309 Montgomery St.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company.

San Francisco, May 25, 1882

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 7, of ten cents (10c.) per share, was declared payable on Monday, June 12, 1882. Transfer Books closed on Friday, June 2, 1882, at three o'clock P. M. This dividend is payable at the Farmers' Loan and Trust Company, in New York, on all stock issued there, and at the office in this city on all stock issued here. WM. WILLIS, Secretary.

Office—Room 29 Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, June 2, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, dividend No. 42, of seventy-five cents (75c.) per share was declared payable on Monday, June 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Company in New York.

WM. WILLIS, Secretary.

Office—Room No. 29 Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

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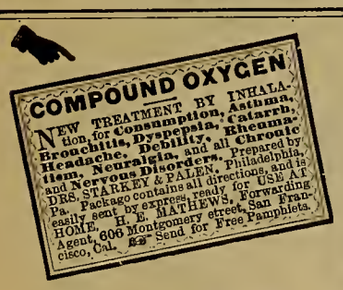
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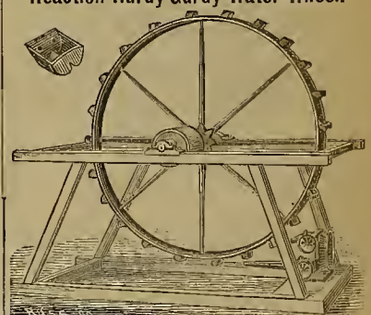

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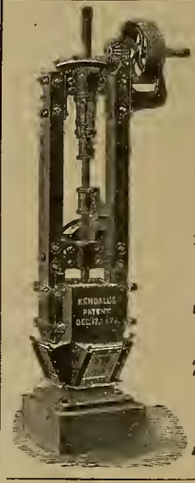

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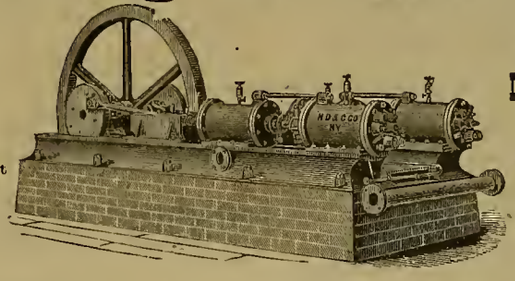

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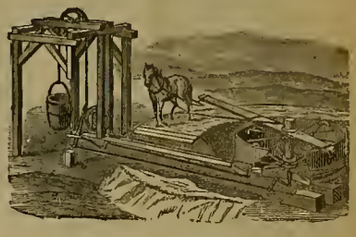

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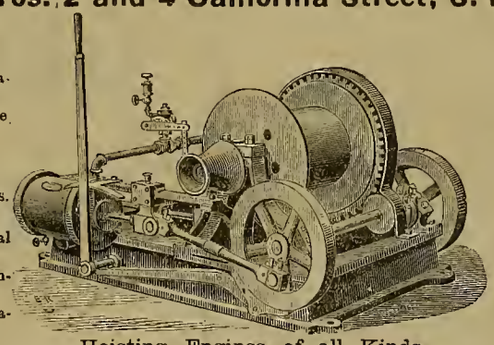

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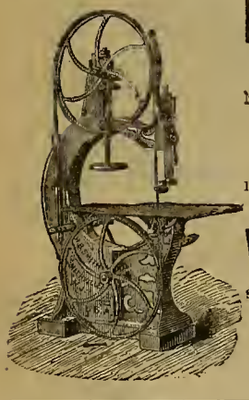

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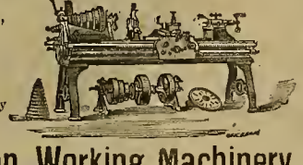

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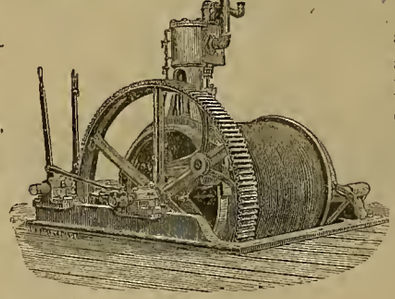

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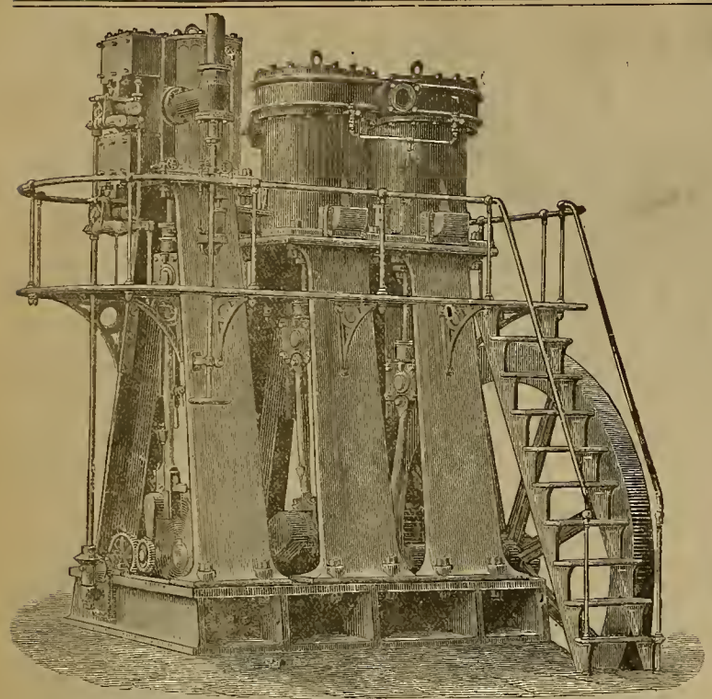

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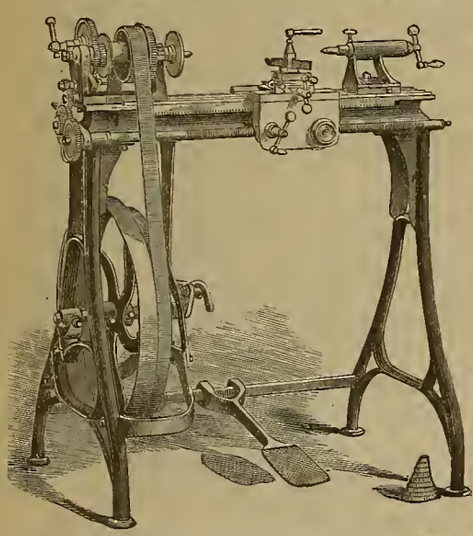

This cut represents a new screw cutting Foot Lathe which was put on the market about two years ago to meet the demand for a first-class tool at a low price, which will do a great variety of work, both in metal and wood, and is the best Lathe made, considering its capacity and price. The cut gives a good idea of its appearance, and below we give dimensions of parts and general description.

Description of Lathe, 4 ft. Bed.

The Lathe occupies a floor space of 28 by 48 inches, the centers being 44 inches high from the floor; the bed is 48 inches long, 6½ inches wide, 5½ inches deep, with double Vs. for Carriage and Tail Stock. It swings 10 inches over bed and 6 inches over carriage, and will turn 26 inches long.

The Head Stock is back geared, and the Cone has three speeds for 1¾ inch belt, the smaller being 3 inches diameter, the larger 6 inches diameter; this, with the back gears gives six different speeds, the fastest giving about 1,000 revolutions of the Arbor to 100 of the Balance Wheel; and the slowest, 75 of the Arbor to 100 of the Balance Wheel; this gives a sufficient range for all kinds of work.

The Arbor in Head Stock has a ⅜ inch hole through it, which is very convenient for turning the ends of long rods, making small screws, studs, &c. The Centres are ½ inch diameter. There is an attachment in Head Stock for reversing the motion of Carriage.

The carriage has a rack and pinion for moving it by hand, and a split nut moved by a cam on the face of Carriage to throw it in gear with screw; the reversing motion is in Head Stock.

The Tool Post has a slot for tools ⅝x1½ inches; the tool is adjusted by a wedge made on the arc of a circle and fitted to a convex washer. The leading screw runs the whole length of Lathe, and has 10 threads to the inch. A set of gears go with the lathe which will cut all common threads and a great variety of other sizes by compounding them; there is a screw stop on the Carriage for screw cutting, &c.

The Tail Stock can be set over for turning tapers, &c. The spindle of Tail Stock is 1 1-16 inches diameter, and has a motion of 3 inches. The center is fitted to a taper hole, which is the method adopted by all the best makers, and is the same size as the one in Head Stock, so that chucks and other tools fitted to one can be used in the other.

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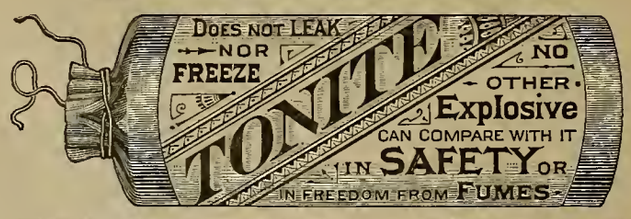

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TWENTY-EIGHT PAGE EDITION.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JUNE 17, 1882.

VOLUME XLIV Number 24

Water Required in Working Quartz.

The quantity of water consumed in the battery varies with the character of the ore and the degree of fineness to which it is to be crushed. Usually, in the Washoe mills, the consumption is between 250 and 300 cubic feet per ton of rock treated, or from one-third to one-half of a cubic foot of water per stamp per minute; but this includes the water used in the pans which does not pass through the batteries.

In a 24-stamp mill, in that region, the tank contained 4,400 cubic feet of water, which was sufficient for eight hours' work of full duty. This mill, which crushes 55 tons per day, discharges at one side of the mortar, through a No. 6 punched screen.

The consumption in this instance is equal to 240 cubic feet of water per ton of rock, or .38 of a cubic foot of water per stamp per minute. Making a due allowance for a portion of the water used in amalgamation, without having passed through the batteries, the quantity actually used in crushing does not exceed one-fourth, or, possibly, three-tenths of one cubic foot per stamp per minute.

The method of measurement in the delivery of water is by miners' inches. A miner's inch is the quantity of water that will pass through an orifice one inch square in the side of the measuring box under a head usually of six inches. The measurement is not uniform throughout the crushing, as different heads are used in different places. Generally, however, in this State, the aperture is made two inches deep, and as long as need be in order to furnish the number of inches, and the water in the measuring box, which is at one end of the supplying flume, is allowed to attain a hight of six inches above the center of the orifice.

The quantity of water that will pass through an orifice of one inch square in the side of the box, under a head of six inches, is determined by Mr. Hagne by multiplying the area of the orifice by the theoretical velocity $\sqrt{2gh}$, and taking two-thirds of the product as effective discharge, ie .02633 cubic feet per second, 1.578 cubic feet per minute, and 94.68 cubic feet per hour. The mill just referred to uses five inches of water. Assuming that its measurement is uniformly in accordance with the above conditions, the amount delivered in 24 hours is 11,361 cubic feet; equal to about 2063 cubic feet per ton of rock treated. Taking the operation of this mill as a criterion, one inch of water is a supply for five stamps, including the quantity required for amalgation as well as crushing.

According to Clarence King, the consumption of water in some of the Colorado mills, where the subject was investigated, was about 400 cubic feet per ton, costing about 18 cents per ton of rock.

The circular of the Union Iron Works, of this city, gives the amount of water required in working quartz as follows: Each stamp uses 10 lbs. per minute; each pan uses 16 lbs. per minute; each settler uses nine pounds per minute.

If the water is run from wells into settling tanks, it can be saved with a loss of 20%. This will make the actual supply of water required in pounds per minute to be as follows: 1 stamp, 2; 1 pan, 3.2; 1 settler, 1.8.

For a 60-stamp mill the following amount will be required: 225-horse power will require per minute 169 lbs.; 60 stamps, 600 lbs. per minute; 22 pans, 352 lbs. per minute; 11 settlers, 99 lbs. per minute. Total water required, 1,220 lbs.

Of this, 1,051 lbs. used for stamps, pans and settlers can be re-pumped to the tank at a loss of 20%; and the 169 lbs. for the engine can be condensed at a loss of 50%. This will leave the actual amount to be supplied as follows:

20% of 1,051 lbs.	210.2 lbs.
58% of 169 lbs.	84.5 lbs.
Total water per minute	294.7 lbs.

DISASTROUS floods have occurred at Worseley, Hungary. A number of houses and two bridges were destroyed. Twelve children and several adults were drowned.

Ore Sampling.

Mr. S. A. Reed contributes to the Columbia School of Mines *Quarterly* an article on "Ore Sampling," which we here reproduce, with the engravings.

With the growth and multiplication of large custom works for the reduction of ores of the precious metals, has come sharp competition in the purchase of such ores. In the purchase of ores according to an established schedule, a prime necessity is an accurate estimation of the value of each lot—an estimation which shall satisfy both purchaser and seller. Where a mine reduces its own ores, very accurate estimation of the value of separate lots is seldom necessary—all that is required is a tolerably close notion of the working of the process, general percentage composition for the calculation of charges, and an approximate valuation of principal and by-products so as to minimize losses. But with a dozen concerns bidding for a single mine's product, as is often the case in Colorado, exact sampling must be assured, or a bid becomes merely a bet.

Again, a variety of causes have contributed to the strengthening of metallurgical works at large railroad centers, at the expense of works near the mines, so that it often pays better to ship ore of a certain character than to reduce it locally. The business of shipping ore has led to the establishment of a special class of mills called sampling works, whose sole function it is to determine correctly the coin value of lots of ore brought to them.

The sampler acts in one of several capacities. He is either a special agent or buyer for some particular metallurgical works at a distance—or he is an independent buyer, buying all lots coming to him, and shipping on his own account to the best market for the particular kind of ore in hand—or he is a broker to whom the miner ships his ore to be sampled and sold by the sampler, as the miner's agent, to the highest bidder. In any case, the object is to make a determination which shall be first accurate; second, simple and easily inspected; third, cheap. Various methods of ore sampling are in use, but it can be safely said that the subject has been more scientifically studied and carried nearer to perfection in Colorado than anywhere else. By observing a few fundamental principles, almost any one of the sampling methods in vogue will give a good result, and a sampling works does well occasionally to check its favorite method by some other.

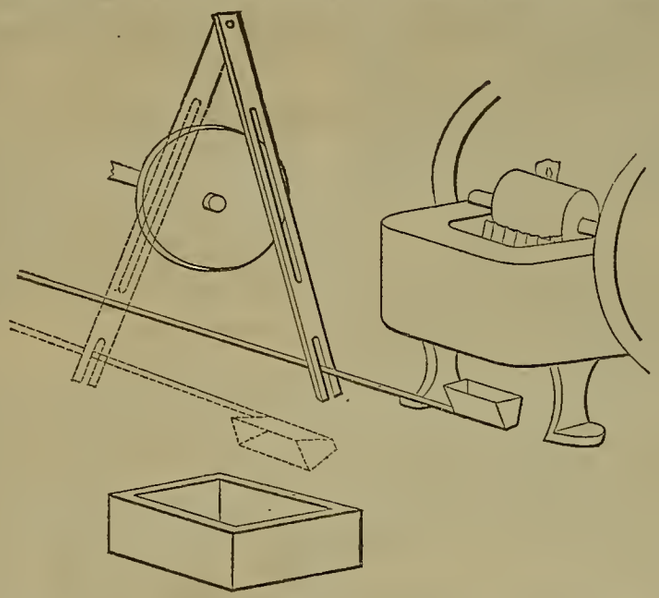

FIG. 1.

FIG. 1—AUTOMATIC SAMPLER FOR INTERMITTENT ORE SAMPLES.

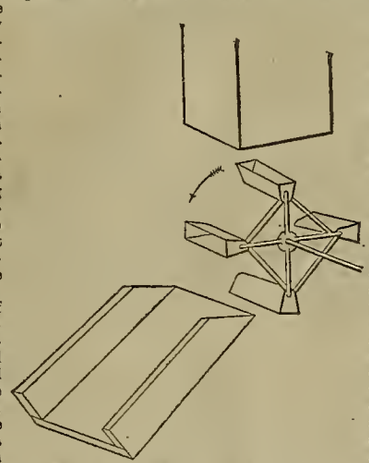

Fig. 2—Revolving Ore Sampler.

The particular method vary in different works. Stamp mills take samples from the batteries at stated intervals; some works take every tenth shovelful as a sample; others mix in a heap by raking the heap around with the shovel in a spiral, from the center out, and then quartering, taking diagonally opposite quarters, re-mixing and re-quartering; others throw everything over a narrow scoop which catches a portion from each shovel; and finally, some adopt automatic devices for performing some one of these methods. The tendency is undoubtedly toward the general adoption of the scoop-shovel in some form. Automatic devices are excellent in some cases.

An automatic sampler used in a Leadville mill for taking intermittent samples directly from a Blake crusher is shown in Fig. 1. A Georgetown mill has a sampling device, also on the intermittent principle, consisting of four cups, as in Fig. 2, caused to revolve slowly under a falling stream of ore, the cups discharging their samples into a receptacle at one side. (To be continued.)

Sluice Boxes.

These are the highways on which hydraulic mining is carried on, and their greater or less efficiency has an influence upon this business like that of the establishment of railroads or common wagon roads upon general commerce. Just as, by the cheapening of carriage, railroads open coal fields, grain-producing regions, etc., to the markets of the world and to a brisk commerce, where common wagon roads would barely sustain a weak home trade, so well-adapted sluice boxes will render inferior gravel deposits "paying institutions," while, per contra, rich gravel deposits, without proper facilities for the placing of sluice boxes, are worked at a loss.

Some mines are worked with as little grade as three inches, others as high as nine inches, to each box of 12 ft. In the first instance, abundant and cheap water generally compensates in some degree for the lack of grade, in the other a very high grade is given to make up for the limited supply of water.

Six inches for each 12 ft. is established as the general grade, though many prosperous mines are worked with four and one-half and five inches for the same length of box.

The establishment of undercurrents and drops must be borne in mind when the grade for sluice boxes is being laid out, as it is advisable to establish a number of undercurrents on a long line of sluice boxes, even at the sacrifice of some grade.

Sluice boxes, with five inches grade per 12 ft., with a number of undercurrents, are preferable to sluice boxes having six inches grade without undercurrents.

The size of sluice boxes must necessarily depend on the work they have to perform, and may vary from four to six feet in width.

Whenever a current occurs in the line of the sluice boxes the larger bend or outside ought to be raised from ½ to 1 inch, according to the degree of curvature. This will check the force of the current towards the outside curve, and distribute the flowing matter evenly over the entire bottom of the flume, preventing the wearing of a deeper channel in the pavement on the outer side of the box.

TRADE MARK DECISION.—The decision of Superior Judge Allen in the case of Buckingham & Hecht vs. Porter, Slessinger & Co., both wholesale manufacturers of boots and shoes, has resulted in another action in the United States Circuit Court by Porter, Slessinger & Co. against Buckingham & Hecht, for damages and accounting. In the original suit it was claimed by plaintiffs, that Michael Hecht devised, and the firm adopted and appropriated the word "Ironclad," as a trade mark applied to rubber boots, in March, 1879. The word was chosen as an arbitrary symbol to distinguish their boots from all others in the market. The plaintiffs claimed that they had the sole use and proprietorship of the trade mark to October, 1880, when Porter, Slessinger & Co., began selling a water-proof leather boot under the same trade-mark, and have been using it since that time. Plaintiffs asked that defendants be enjoined from further use of the word "Ironclad," and that damages be awarded for an infringement. Judgment was rendered in favor of Porter, Slessinger & Co., who now bring suit against Buckingham & Hecht for damages and an accounting. The decision of Judge Allen in the former case says: "The word 'boots' does not denote a class; 'rubber' boots and 'leather' boots belong to different classes, and no one is deceived by defendants using the word 'Ironclad' on their leather boots." As the case involves questions as to the force and reach of the trade-mark laws, the decision in the new action will be looked for with interest among business men. By the above decision of Judge Allen, Porter, Slessinger & Co. have the sole right to the trade-mark "Ironclad," on all leather boots and shoes.

RECENT soundings show that Tulare lake is only 20 ft. in depth at the deepest place, whereas in 1873 it was 31 ft. This fall of 10 ft. within nine years is quite remarkable.

The Engineer.

Brickwork Under Pressure.

During the construction of a tunnel under Dorchester hay, in Boston, it becams necessary to construct a brick hulkhead that had to withstaud the pressure due a water column 160 ft. high, and as it was intended to shut off a leak amounting to 240,000 gallons per 24 honrs, it had to he watsr-tight. D. Stauffer gave the following description of this work before the Engineer's Cluh, of Philadelphia:

The tunnel section at the point selected for the bnlkhead was practically 10 ft. square. The hulkhead was huilt directly across the tunnel, 50 ft. in front of the heading where the water was struck. Plank dame filled with puddled clay were first thrown across the tunnel each side of the hulkheed site, and a six-inch wrought-iron pipe used to carry off the water during construction—the pips being huilt into the brickwork. An arch-form was adopted, four feet thick at the crown and two feet rise in a span of 10 ft. Herd-hurned hricks were used, leid in morter made of one part English Portland, and one part Newark Rosendele, and two perts clean, sharp send—e compound found eqnally strong with Englisb Portland and send, one to one, aod having the advantage of working smoother on the trowel, and adhering hetter to brickwork in wet places. Skewhacks for the arch were roughly picked out in the rock at the sides. After the cement had set, the water was shut off hy screwing a cap on the outer end of the six-inch cap. The pressure ageinst the wall was 72 and one-tenth pounds per square inch, or ahont 519 tons distrihuted over the face of the hulkhead. The wall was tight for ahout 48 hours; then water ceme throngh the hrick itself, rather than through ths joints, in amount equal to one-half the original volume. The water was let off and a second experiment tried. The main wall was torn down sufficiently to allow men to pass behind it, and a second wall only 12 inches thick was huilt hack of the first, and two feet distant. The space hetween thsse walls was well rammed with puddled clay, extending to the rock on all sides. The eecond wall was made pnrposely light, as its yielding to the pressure would only more effectually consolidete tbe clay hetweeu it and the unyielding wall in front. The hond used in the main wall wae one so laid that there were no continuous horizontal joints through the wall. The result of the lest contruction was to completely shut off the water from thie leak, at a saving of fnel and pumps. The Dorchester Bay tunnel is 7,000 ft. long, with its average invert grade 143 ft. helow low-tide mark in the hay under which it passes. The tunnel is driven through a formation of clay, slates and conglomerates for its entire length; rock very seamy, and much water encountered.

We may add that in mining hulkheade which often must carry much greater pressores, the practice is to let the water rise slowly behind the hulkhed, hy allowing a portion of the water to flow through a safety-valve at the hottom of the level. It has heen the experience in all such cases that in the beginning quite a quaotity of water will come through the pores of the hrickwork, which is said to he "sweating." Gradually, however, the pores are filled with carbonate of lime, aod a thick coat of thet suhstance forms on the face of the hulkhead, completely cutting off the flow of water. A column of from 400 to 500 ft. has heen horne for many years hy such hulkheads.—*Industrial World.*

An Elevated Electric Railway in Berlin.—The question of an electric railway for Berlin is heing considered. The railway wonld run from the west to the east of the city, and would establieh direct communication with the metropolitan railway. It is to he constructed overhead and supported on high columns. The trains are to lower themselves, on arriving at eech station, to the level of the etreet, for passengers to get out and enter, and will then agein he elevated to the level of the line overhead, all this heing accomplished hy power supplied hy means of electricity.

The Channel Tunnel.—The Englisb Channel tunnel is to he 22 miles long, 18 ft. hy 20 ft. wide, and have two railroad tracks. From each end there will he down grade of one to 80 for four miles, aod then a rise of one to 2,460 in the center. The rock and earth to he taken out would make a pyramid as large as the great one in Egypt. It is estimated that the yearly receipts will be £850,000 from passengere, £300,000 from freight and £50 000 from mail. If expenses take 40% of this, there will he £732,000 left for interest on the capital.

The Corinth Canal.—The ceremony of turning the first sod on the line of the proposed Corinth canal was performed hy the King of Greece, April 5th. The canal will connect the Gulf of Corinth with the sea of the Archipelago, and considerahly shorten the route from the western parts of the Meditsrranean and the Adriatic esa to Athens and the ports of the Egean sea.

The next meeting of the American Institute of Miniog Engineers will he held at Dsnver, Col., on Mondey, Angust 21, 1882. The time they fixed will occur during the continuance of the Colorado Mining Exposition, which commences at Denver, Aug. 1, 1882.

Useful Information.

To Cleanse a Soiled Chamois Leather.—Many workshops contain a dirty wash lsather, which is thrown aside and wasted for the want of knowing how to clean it. Maks a solution of soda and warm watsr, ruh plenty of soft sosp into the leather and allnw it to remain in sosk for two hours; then ruh it well until it is quite clean. Afterward rinse it well in a weak solution composed of warm watsr, soda and yellow soap. It must not he rinsed in water only, for then it would hs so hard, when dry, ae to he unfit for nse. It is the small quantity of soap left in the leather that allows the finer particles of the leather to eeparate and hecnme eoft like silk. After rinsing, wring it well in a rough towel and dry qoickly; then pull it ahout and hrush it well, and it will become softer and hetter than most new leathers. In using a rough leather to toncb up highly polishsd surfaces, it is frequently observed to scratch the work; this is caused hy particles of dust, and even hard rouge, that are left in the leather, end if removed hy a clean, rougy hrush, it will then give the brightest end hest finish, which all good workmen like to eee on their work.

About Buckwheat.—A French authority (G. Le Chartier) says that freqoently huckwheat straw is richer io phosphoric acid then the grain itself, which is never the case witb other cereals. A crop of huckwheat takes more fertilizing matter from the ground than other grain does if the straw is removed from the ground. Buckwheat straw rotted and used as manure is a valoahle fertilizer for any grain crop. Buckwheat sbould he well hulled before it is passed to stones or rolls. Rollers with sharp corrugations have heen used successfully for making huckwheat flour recently. Cranson's hnckwheat huller is a good machine for the purpose. Old stock e'one of a very porous nature ehould be used. The furrowe should he smooth and have a fine feather edge. From 8 to 14 cracks per inch ehoold he put in. Ahont 60 pounds of flour should he prodnced from 100 pounds of buckwheat. It should he run through a No. 14 holting reel after the first grinding, and that which does not holt through ehould he returned to the stones end re-ground and bolted again. A great deal of huckwheat is reised in the New England and Middle Stetes and in the province of New Brunswick. It is however raised, we helieve, in all of the Northern and Western States to a greater or less extent.

The telephone is an invention of such recent origin thet it hae scarcely yet lost its novelty, bnt already the telephone service has attained astoniehing proportions. The Americen Bell Telephone company has now no less than 189,374 instrnments in use hy cnetomers. It has 592 exchanges in operation, 70,525 snbscribers and 49,168 milee of wire. These figures show an enormous increase during the past year. The chief difficulty of extending the service in greet cities appears to he that of conveying the innnmerable wires throngh the streets. The company is etill experimenting in regard to the use of underground wires, and if successfnl in this direction will he able to greetly incresse the extent and efficiency of its service. It should, then, also largely decrease the charge for the oee of instrnments, which at present ie excessive.

Aluminum silver is made hy melting together one part of silver witb three or four of aluminum, and is very valuable for articles in which one of the main nhjects is to ohtein lightness, snch as the instrnments used for marine observatione. Octants and sextants of this alloy have been received with great favor by practical navigators. Those parts of euch instruments which, if made with other metal, would weigh four pounds, will, when made of the ahove alloy, only weigb one pound. Mechanics like to work this alloy, as it can he turned and filed away, whicb ie not the case with the pure aluminum, which is too soft, and, as no doubt all know who have worked this interesting metal, it has the objectionable property nf sticking to the file.

Shrimp canning is an industry which might he advantagoosly introduced into California. Tbis business has recently heen added to the industries of New Orleans. One new estehlishment employs 150 boys and girls and from 20 to 30 skilled workmen. Already the output is 10,000 cans a day, and it is expeoted that the product will soon he douhled. The shrimps are cooked and cenned hy a new process. It is intended to undertake also the canning of oysters, which are ahundant along the gulf coast, and, during the proper seeson, the figs and otber froits of the South.

A New Floor Covering.—A Jersey City man has patented two improved floor coverings. One is a fahric coated with a mixtnre of ground leather and mineral liher and a hinding of herd varnish, and the other is a coating of ground wood, or some other vegetahle fiher, mixed with mineral fiher and a hinding of copal. These coverings are claimed to he remarkahly cheap and durahle.

Stockings divided so as to separate each toe, as a glove does the fingers, are now hsing introduced, and an eminent medical authority recommends them, as they are likely to promote cleanliness, prevent troublssome soft corns, and abolish foot deformity.

Rubber-stamp Ink.—The following proportions ars said to give an excellent rubher-stamp ink, which, while not drying up on the pad, will yet not readily smsar when not impressed upon the paper: Aniline red (violet), 90 grains; hoiling distilled water, ons ounce; glycerins, half a tsaspoonful; treacle, half as much as glycerine. The crystals of the violet dye to he powdered and rubhed up with the hoiling water, and ths other ingredients stirred in.

An Early Oil Well.—Forty-one years ago a well was sunk to the depth of 1,000 ft. in Stoyestown, Somerset county, Pa., in the expectation of getting salt. A greasy, foul-smelling fluid csme to the surface instead of salt, and the well was ahandoned. The facts about this well having come to the knowledge of some oil operators, they visited the place, found favorable indications, and leased 3,000 acres of land in the vicinity, and are ahout to begin the sinking of test wells.

To Clean Silver.—The simplest and cleanest suhstance for cleaning silver articles is, according to Prof. Davenport, hyposulphate of soda. It acts quickly, and is inexpensive. A rag or hrueh moistened with a saturated solution of the salt cleanses even strongly oxidized silver surfaces in a few seconds, without the epplication of any polishing powder.

Waterproof muslin is hstter for coverings to chicken coops in cold weather then hoards, as it admits heat from the sun. To render fahrics waterproof, dip them into water which contains one-fifth of its hulk of soap in solution. Let the cloth dry, and then immerse in water coutaining 20% of sulphate of copper in solution.

To fasten emery to leether, hoil glue very thin, add a little milk, raise the pile of the leather, and put on the glue with the hrnsh. Then sprinkle on the emery and let it cool.

Good Health.

Meat a Cause of Nervous Disease.

A writer in the *London Lancet* hae recently discovered the fact thet flesh food is stimulating in character—a discovery made at least half a century ego hy a large number of thinkere, and advocated for nearly that length of time hy the memhsre of the Vegetarian Society of England, and by numerous writers in this country, as well as in Germeny and in many other European countries. We qnote the remarks referred to as follows:

"Nervous diseases and weaknesses increase in a country as the popnlation comes to live on the flesh of the warm-hlooded animals. This is a point to which attention has not heen adequately directed. 'Meat'—using that term in its populer sense—is highly stimulating, and supplies proportionally more exciting than actuelly nourishing pahulum to the nervous system. The meat-eater lives at high-pressure, and is, or ought to be, a pseulierly active organism, like a predatory animal, always on the alert, walking repidly, and consuming large quantities of oxygen. In practice we find that the meat-eater does not live up to the level of hie food, and as a consequence he cannot or does not take in enough oxygen to satisfy the exigencies of his mode of life. Thereupon follow many, if not most, of the ills to which highly civilized and luxurious meat-eating classes are liahle."

We cannot strengthen the ahove statement in any wey, unless it he hy indoreing it, as it presents the facts in their strongest light, and so unequivocally that there is no room fof cavil. There is no douht but that the free use of flesh food is an evil against which the puhlic sbould hs thoroughly warned.

How to Prevent Spring Biliousness.—Several correspondente who are efflicted with what is termed "spring biliousness" are interested to know how it may he prevented. Biliousness is not, as meny people suppose, a disease of the liver, hut pertains almost altogether to the stomsch. It is chiefly the result of over-eating, eating too freely of eweets, pastry, fate and highly seasoned dishes. The cold, tonic air of the winter monthe antidotes the bad influence of these digressions in diet in some degree; hnt as the warm, relaxing weatber of spring comes on, the stomach hegins to fail more perceptihly in its efforts to accomplish the unnecessery and injurious labor imposed upon it. Indigestion is the result. By-and-hy the poor stomach gets so far hehind in its work that it is altogether overwhelmed and disahled, and the difficulty culminates in a bilious attack, which is nothing more nor less than a cessation of work on the part of the etomach. The overworked organ needs rest. A hilious attack can always he prevented by giving the stomach rest hy fasting for a meal or two before the final crasb comes. No organ in the body will endure more ahuse and still patiently continue its work than the stomach. But finally, forbearance ceases to he a virtue, and the faithful servant rebels against ahuse. Correct and propsrly regulate the diet, and there will he no more trouble with hilious attacks at any season of the year.—*Good Health.*

Biliousness.

What Causes Biliousness?

Answer.—Food is of two kinds—nitrogenous, or tissue-making, snd non-nitrogenous, nr heat-producing. The first serves to huild up and repair waste in the human system; ths othsr is composed of carbon and hydrogen, which is oxidized or hurned in the systsm, furnishing the heat snd force of ths animal sconomy. One goes to huild the machinery; the other supplies the heat, or force, which runs it.

The heat-making elements are carhon—as starch, sugar, etc.—and hydrogen, which is furnished in combination with carhons, in oil of every kind. These hear ahout the same relation to starchy food that stone-coal does to charcoal—a given weight furnishes more heat. Hence it is that these hydro-carhons are demanded as food in extreme northern latitudes.

The amount of heat or force the system can generate is not limited hy the capecity of the stomach for food, hut hy the ahility of the organism to oxidize, or burn, the cerbon and hydrogen. The heat or force that cen be produced is determined and limited hy the capacity of the luuge for air, and hy the power of the system to absorh oxygen and comhine it with the carhon and hydrogen of food. Increase the amount of air hreathed, of oxygen absorhed into the circulation, and the amount of heat generated and force exhihited may he proportionally increased; but if a man eats two pounds, instead of one, of carhonaceous food, the amonnt of force generated is not thereby increased, for but a limited amonnt of it can he oxidized.

The Cause of Biliousness.

Answer.—Pleese remember that the product of the combustion which we are considering is cerried hy the blood to the excretory organs of the hody. The hlood also carriee off, as impurity, the worn ont tissue, which is replaced hy the nitrogenized food appropriated hy the system. These impurities are thrown off by the lungs and skin, are secreted by the kidneys, or are strained from the blood hy the liver. That which the liver removes from the hlood ie the *bile*. It is thrown hack into that pert of the alimentary canal called the *duodenum*, or eecond stomach. Here, in normal quantity, it is of use in quickening peristaltic action, and promoting digestion and absorption. Now, suppose a person takes more food than the syetem requires, what becomes of the excess? How does it get out of the system? Most of it passes into the circulation. It is there a foreign matter, to he removed. To remove it, the kidneys are overworked; the pores of the skin become clogged. The lungs refuse this work, and throw off only the product of comhuetion. The blood, overloaded with these impurities, is continually strained through the liver. The flow of hile is increased; the liver is enlarged, or, at least, it is unnaturally active; the hile overflowe into the stomach, and all the distressing symptoms of hiliousness follow.

Bilious diseasee are less frequent in cold climates, hecause, to keep up the animal heat, more food is needed and oxidized. The hurning of chercoal on a fire is hut the uniting of the osrhon of the coel with the oxygen of the air; thie generetes heat. So the nnion of the carhon of food with oxygen, in tbe humen system, gives heat. In cold climates, all the food eaten may he needed to supply heat enough to enahle a person to resist the intense cold. But if the same amount of food is taken in a warm season, or climate, it is unconsomed in the system. It becomee foreign matter in the hlood, to be removed hy the excretory organs; end hiliousness results, as hefore explained. Hence, we find that Northerners, going to Southern cities, are subject to fevers. They take with them an appetite for, and habit of eating, the heat-producing food which they require at the North. For the same cause, hilioos complaints are more prevalent in summsr than in winter.

Want of cleanliness and impnre air, also, cense biliousness, hy preventing perspiration and the exhalation of impurities from tbe lungs. —*Life Crystals.*

The Best Gymnasium for Girls.—The exercise that is hest adapted to develop all parts of the hody in a netural, healthy manner ie domestic lahor. It ie always at hand; it can he taken regularly every day, and there is such variety that almost every muscle can he exercised. Housework ehould never he considered menial or degrading; it is nature'e lahoratory, in whicb the girl may ohtain, not only the hest physical development, bot most valuahle knowledge thet will fit her for the practical doties of life. This traioing may he supplemented by other kinds of exercise, soch as walking and ootdoor sports. The very general introduction of foreign help into domestic service has proved most nnfortunate for the health of American women. Closely connected with this neglect of physical training at home is an evil of great megnitude—that is, eupreme devotion to hrain work. The practice, pursued very generally at the present day, of confining girls in schools or seminaries for a series of yeere consecutively, ie attended with the most serious evils. In the language of a popular writer, "it is edncating our girls to death." While we would not discard education in all its various departments, extending to tbe highest culture, we maintain that it is no advantage or hlessing if it ie to be ohteined at the expense of the physicel eyetem. There are other parts of the hody hesides the brain that need faithful training. The highest accomplisbments and mental acquisitions will not compensate for impaired constitution and poor health.—*Our Continent.*

MECHANICAL PROGRESS.

The Effects of Heat on the Bending Qualities of Iron.

A few weeks since we noticed the results of an interesting series of experiments respecting the influence of temperature on the strength and ductility of steel and iron, which had been made hy Mr. J. F. Barnahy, the resident Admiralty overseer at Sheffield. That gentleman has also carried out a series of tests with samples of iron pletes, with the view of ascertaining the heat or temperature at which iron that is neither cold nor hot short is liahle to fail in hending, and is nnsafe to work. The results of these tests are given in a copiously illnstrated report. Oot of tho many experiments made, Mr. Barnehy illustrates a number which show the general character of the results obtained. He observee that iron is very similar to steel in this respect, hnt the fracturee are different, for while steel, at the temperatures shown hy him in his former report, fractures nearly through the sample, on account of its homogeneous charaoter, iron, at the temperature shown, fractures to the depth of one or more of the hars or layers of which the plate is made, iron plates being made from a pile made np of various hars, according to the weight, size and quality of the plate reqnired; thus the frequent laminations which occur. These defects are very rare in steel, and only occur when pieces of ganister, etc., from the runners, linings of the furnaco, or converter, get, by accident, into the molten metal, hut in the case of iron, if great care is not taken in making the pilee for rolling, and also caro in heating, laminatione will frequently occur. In making these experiments, Mr. Barnahy endeavored, by testing the iron at various degrees of heat, to ascertain that which is most dangeroos, and he ie of opinion that at from 400° to 550° F. it is more liable to fail in bending than if hent cold. In hie former report it ie shown that these different temperatures have the effect of increasing the tensile strength of the material, and, to a certain extent, reducing the ductility, which, together, show that the iron or steel is considerahly stiffened. Thie, he thinks, will account for the falling off in its hending qualities. He states that he has arrived at these temperatures by the color of the fractures as given in scientific works. The report is of a very interesting and instrnctive character.

Mechanical Arts Early in the Eighteenth Century.

Chamberlayne, in bis "Present State of Great Britain," 1726, says: "Here (in Great Britain) are the hest clocks, watches, locks, harometers, thermometers, air-pumps, etc., in tbe world. The late Queen Mary had a clock, made by Mr. Watson, late of Coventry, worth £1,000, in whicb are all the motione of the celestial hodies. Locks are here made of iron and brass, of £50 a lock. Watches so corieus that one part of the movement of a repeating watch comes to £10, which makes them ordinarily £50 or £60 a watch; and yet these prove profitable merchandise when we send them into foreign countries, so valuable and eo inestimahle is the work. Curious telescopes, microscopes, perepective mirrors, spheres, globes, charts, maps, and all sorts of mathematical instruments, dials, halances, sea-compesses, etc.; the late improvement in making glass; of polishing the insides of great iron gnns; of weighing up ships that are sunk to the bottom of the sea; in fisbing, as they call it, for money lost, it may he, 100 years ago, and many other nohle inventione and improvements, as weaving silk etockings, mills of copper, gunpowder, polishing glass, etc.; Mortlake tapestry, earthenware of Fulham, epeaking trumpets, making of luetring, enginee for raising of glass, epinning of glaes, cutting of tobacco, printing stuffs, linen and paper; making damask linen, watering eilks; the way of eeparating gold from eilver; bolting mills, lanterne of divere eorts, cane chaire, making hornware, etc.—all theee inetancee ehow how excellently the Englieb nation ie turned for all manner of mechanical arts."

COTTON BELTING.—It is hut a short time that cotton helts have heen menufactured in such a manner ae to jnstify their general adoption as driving helts. Some of theee have lately heen brought into the market, and are known as Scandinavian belts, appearing to answer their purpoee admirably. They are eimply a cotton fahric, which is lighter, more elaetic, and more durahle than leather, and, therefore, particularly adapted for high epeeds. For most purposee, and especially for heavier helting of thie kind, a coating of wood tar is found an advantage, while for emall hands, euch as are used for spinning machinery, the unprepared raw cotton helt ie used. The cost of mannfactnre of theee helts ie very small, as compared with leather, and by the peculiar method of weaving them, they do not fray out at the edge or break after being worn at the edge hy running againet a helt fork. The woven helte have, however, their disadvantages; they etretch and ehrink more than leather helts, hut, once taken np sufficiently, they run more smoothly than leather, eince they have hot one joint, and are perfectly uniform. When they get damp they have the disadvantage of shrinking slightly. Experiments have heen made in regard to their tensile strength, and it was found that a cotton helt three and one-half inchee wide hroke under a load of 4,187 lbs., while a leether helt of good quality, four inches wide, was hroken with 2,100 lbs. It is, nevertheless, advisahle to use wider belts when replacing leather hy cotton, since they are hest used of ordinary thickness; this is, however, also in accordance with good practice in leather helting, thick helts having heen found not to answer eo well as thin wide helts, or, at least, requiring disproportionately large helt pulleys.

Steel in Marine Engines.

English engineers are employing steel in the construction of marine engines to a much greater extent than in former years. They nse it for hollow crank shafts, pietons, crank pins and piston rods.

What ie known as steel, however, is a very different material from that universally recognized under this title. It has no characteristics of it, except, poseibly, in its fracture. It is tough, ductile and exceedingly tenacious; so much so that a wagon tire made of it can be hent back and forth several times in the vise, even after a deep nick has heen made in it with a flat chisel, without breaking. When it ie turned in a lathe, or planed, or worked by tools, it is more like horn than metal, but for all this its tensile strength is not bigh. It will not harden in fire and water, and in short hae none of tho characteristics of steel. Indeed, when it ie imported it is termed ingot iron, to evede the duties. It is steel when it ie to make part of an engine, but iron in commerce.

Its character may be judged of by mechanics when it is known that this so-called eteel ie worked up into scrap forgings. Two heavy stern frames, weighing 20 tons, for an English steamship company, were made from eteel scrap, as also eeveral details, such as link motions. It is, in fact, a very superior qoality of iron, hut perhaps it sounde hetter to call it steel.

In this connection it may he proper to say that steel rivets are not universally popular ahroad, owing to the difficulty in getting the hoys to heet them properly. Not heing able to distingoish the difference in the heat needed on steel as compered to iron rivets, they hurn the former so often as to disconrage the introduction of them in general use. One firm, however, mede 1,800 tons of them last year.—*Industrial World.*

A Novel Motor.

An interesting engine, of whioh we here give a hrief description, has recently heen invented hy Messrs. Roettger and Bay, of Brnssels. Motion is produced hy subjecting a compound plate, composed of two metals, the degrees of expansion of whicb are different, to the action of heat and cold alternately. Tbe compound plate oonsists of pieces of steel (not tempered) and hrase riveted one upon the other, the latter heing placed helow the former. Any other suitable combination of metals may, however, he used, the important point being that the expansion of the two metals should differ by an appreciable amount. By applying heat to the lower portion of the plate, it will expand and assume a convex shape as regards tbe source of heat. Resistance opposing thie expansion may he overcome, and motion will he developed in a certain direction. When tbe heat applied to the plate has attained a suitable degree of inteneity, the gse flame or other beating medium is removed, and the plate, on cooling, will tend to return to its original state, thus developing a further motive nower. A current of cold air or a jet of water directed against the plate will accelerate this action. One end of the plate is fixed to a euitable standard, in a horizontal poeition, while the outer or acting end is connected with a lever. The long arm of thie lever ie jointed, at ite end, to a connecting rod, whicb transmite tbe power produced to a pump, crank or any other suitable mechanical means of utilizing the power thus communicated. By changing the length of the arm of the lever, the etroke may, of couree, be varied when it ie required to obtain greater power than can he prodnced hy one of the compound plates mentioned; a eeries of these plates may he employed, and eoorcee of heat other than gas may he need, sucb as, for example, currente of highly beated air. The apparatus, judging hy present available information, bae not yet heen eucceesfully utilized for practical purposee, and its general introduction appeare to be extremely douhtfol.

THE original eource of power obtained from a water-wheel ie the heat of the eun. In fact, nearly all the power made uee of on thie glohe, whether animal, steam, water or wind power, has its origin in the eame great light-giving, life-sustaining eource. The amount of power thus given out daily hy the eun in the form of radiant heat muet he enormous, and far heyond our comprehenoion. But a very small fraction of it reachee our glohe, and yet when the attempt ie made to eetimate the amount of even that small fraction, onr arithmetic ie too limited.

SCIENTIFIC PROGRESS.

The Electric Age.

The accumulated capital of Europe is seeking "fresh fields and pastures new." There is a redundancy of money in the great financial centers, an overstocked labor merket — as evinced hy the enormous immigration here, and by the eocial uneasiness that in some shape or another is to he seen in almost every European country. How to find employment for these vast savings, and how to find work for the great army of idle hands, is hecoming a serione prohlem. There has heen an enormoue increase of population in Enrope. Small cities have hecome immense hives, containing populations that would formerly suffice for an entire state; some coontries, like England, have donhled their population within half a century; others, like Belgium, have attained a limit which was never dreamed of even hy the most decided of anti-Malthusians. Machinery, on the other hand, has increesed prodoction to sucb a degree that only a vast foreign demand can either justify or sustain it.

But there has heen another canse, the importance of which is certeinly least of all appreciated here. Tbe railway age is, so far ae Europe is concerned, almost over. Much remains to he done, certainly; new countriee will require roads, hut the vast work of reconstructing the transport waye of the great commercial countries, whicb hegan in 1847-48, is now over, like "the glorious days of Aranjuez."

The immense worke which were necessary in adapting steam to every indostry heve heen in great part finished. Chemietry and other sciences are tending more to save lahor and capital now employed, than to find any new uses for them. At the eame time the economized earnings of the nations are continually growing. Savings hanks are loaded; ordinary hsnks will give little or no interest. Governments are endeavoring to fund their debte at lower rates of interest, and that very interesting clase that live on "the interest of their money" are greatly worried in mind, for they are euspicions of "furriners," and dreadfully afraid of Mexicans, Egyptiane and Turks: gentlemen who can he depended upon for one thing—not to pay their dehts. States, too, are huying up all the great railway lines, snd gss shares are regarded with distrust.

In this crisis, electricity comes in to take the place of steam. As light, it will not only replace gas over the world, thus involving an immense hut remunerative outlay of capital, hut will, as an illuminsting power, he used where gss never would he. As a motive power, and the force that cleaves the rocks and girdlee the earth in a few moments, it is the greatest; it will supplant steam in many ways. It will draw trains and coal and ore from mines, and separate the pure ore from the dross; it will propel vessels that, perhaps, may some day he no longer known as steamers; it will run our factories, nnd act as time-keeper and as faithful overseer, showing the error of a grain of overweigbt in the delicate thread; it will give the warning of fire in huildings, and put it out at the same time; it will necessitate an immense reconstruction of maohinery and method in every industry and every art. It will turn night into day in more senses and ways than one. The inventive power and genins of the world is now heing turned to it, for it alone, of all agents, can he utilized in every manifestation of hnman labor.

The steam age is ending; but the world, everlastingly and eternally yoothful, in contradistinction to human empires, knows no degeneration; neither does human civilizstion. We have had an iron age, we are now entering on a golden one. Electricity will give new prospects for progress, new outlets for capital.—*The Electrician.*

ANTS OR MONKEYS.—Letely Sir John Lubbock has heen coosidering the ant family, and after a protracted investigation declares that "antbropoid apes" must yield tbe eecond place in the order beneath man, for his friende the "ants," muet he placed there. "When we conceider the babite of ante," eaye he, "tbeir eocial organizetion, their large communitiee, elahorate hahitatione, their roadwaye, their poeseeeion of domeetic animale, and even in eome casee of slavee, it muet he admitted that they have a fair claim to rank *next to man* in the scele of intelligence." So, according to theee theories, it now appeare that in intelligence, whicb is the crowning glory and epecial attrihute of menkind, the monkey must give place to the ant. Many yeare ago one wise man euggeeted that some of the gentlemen of leieure, who found time hanging heavily on their hands, would do well to "go to the ant" and "conceider her ways and he wiee." It eeeme now that the advice contains more philoeophy than hae generally heen accredited to it.

SENSIBLE EVIDENCE OF THE ROUNDNESS OF THE EARTH.—In a late eession of the Helvetic Society of Natural Sciences, Prof. Dufour epoke of the change whicb imagee that are produced upon a great expanee of water undergo, in conoeequence of the roundnese of the earth. If the luminoue ray from an object etrikes a tranquil lake in a nearly horizontal direction, the image ie made upon a convex eurface and appeare emaller than the object iteelf. Prof. Dufour arrived at these conclueione hy calculation, but he supposed that they could never he verified on account of the difficulty of finding a lake sufficiently calm over a hroad extent of eurface. His friend, M. Forel, however, informed him that he had seen sooh images in the lake of Geneva, and that they appeared exactly as the calculation had indicated. Prof. Dufour snhsequently fonnd that the days upon which soch observations are poseihle are hy no meane unoommon, hut the images can often be seen on lake Lemsn, especially if one has a spyglass at his disposal. After having looked for a moment, the roundncss of the earth hecomee visible as plainly as that of a howl that is held in one's hand.—*Les Mondes.*

THE SUMMIT OF THE EARTH.—Adolphus Schlagintweit, the immortsl, though unpronoucable, explorer of central Asia, calls the highland of Pamir "die Welt-Zinne"—the roof of the world. On the road from Puojsuh to Yarkand four passee have to he crossed that are bigher than 17,500 ft., and for a distance of 280 milee the balting gronnd is not helow the hight of Pike's peak. On the eastern plateau of tho Beloor-Dagh there is a shelter house near a cliff from whose summit the main chain of the Himalayas, with all its giant peaks and immeasurable ice fields, ie in full view, from the highlands of Lassa to the sources of tbe Indns, while in the west the head waters of the Oxue and Jexertes can be traced to the horders of Cahool, where the peaks of tbe Hindoo-Koosh, lift their crests of everlasting snow. In the spring the echo of the avalanche resemhlee the heom of continuous thunder, and io midwinter, when the storm wind sweeps the tableland, whirling pillars of snow scud along the ridges, and often seem to dance together like spectres in their flottering winding sheets. Our "Lend of tbe Sky," in the southern Alleghanies, must be ae a mere pizza compered with that top roof of the earth.—*Popular Science Monthly.*

CAUSES OF MAGNETIC VARIATION.—F. Folie discusses the hypothesis, whicb ie accepted hy many geologists, that the earth is composed of a solid crust, together with a mass, more or lese fluid, heneath the crust. Hopkins bad previously calculated tbe precession and nutation which would result from a fluid nucleus, but his conclusions were not eatisfactory, and Folie gives new reasons for rejecting them. He thinks that the crust would partake, to some extent, of tbe disturbances of the interior, and that the only way in whicb tbe exact latitude of a place could he found would be hy taking observatione when there ie no disturhance by nutation; or hy distrihuting tbe oheervations equally over the whole period of nutation. He further supposee that if tbe solid shell of the glohe oscillates ahout the fluid nucleus, the friction which results from the pressure of the nucleus upon its envelope during this movement should conetantly engender a great qsantity of electricity, which may he one of the principal causee of terrestrial magnetism. The gredual cooling of the interior ought according to this hypotbesis, to he shown hy a diminution of the constant of nutation, and a like diminution of magnetic inteneity. —*Bull. Royal Society Belgium.*

OBSERVATIONS IN THE CLOUDS.—The French Society of Aerial Navigation recently entrusted M. De Poitevin with a series of baloon observations, among which was the study of the formation of cloude, taking into acconnt the vapor tension in neighboring etrata of air, hut of different temperature, and also the study of the release of the latent heat of vaporizstion at the moment of precipitation. One set of three obeervations was made on an opaque cloud which covered the region of Paris for several days. The cloud was hardly 300 meters thick. The upper part of the guide rope was covered with boar-frost. The mean temperature of the cloud was five degrees. The various observations yielded the following resulte: 1. The clouds are formed in tbe zone of mixture of two layers of air saturated with moisture. 2. The clouds originate in the warm layer and dissolve in the colder layer. 3. They move in the direction of the helt of air whicb has the highest temperature. 4. The winds which are observed at the enrface of the ground, which are only effects of the reaction of the principal wind, msy have a hight of eeveral hundred yarde, and may have different directione in neigbboring localities, while the upper current bae a great regularity of direction and inteneity.

SCIENCE.—M. Renan bas, in an intereeting passage of bie own autobiography, given it ae bie belief that a century hence mankind will study very little elee than phyeical science. The time, he thinke, will come when the bietorical eciencee will be thruet into tbe background; all that they have to teach will he known, and men will feel comparatively little interest in tbeir own paet. On the other band, tbe more they know of nature the more there will be to he known. Chemistry and physiology offer inexhaustible fielde for reeearch; and the truthe which they reveal will prove more and more interesting to mankind. It is very difficult to eay what men will think or do a hundred yeare hence; hut it eeeme likely enough that thie will he the tendency of study. Certainly, even now, the men of eelence are hecoming more and more important factore in the life of ue all.

ELECTRIC LIGHTING ie in euccessful operation on more than 60 eteamers of tbe Miseiseippi river and ite trihutariee. It ie helieved to add much to the eafety of that kind of traffic and traveling.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending May 25.		Week Ending Jun. 1.		Week Ending Jun. 8.		Week Ending Jun. 15.	
Alpha	....	....	25c	....	50c	25c	60c	....
Alta	1	80c	70c	10c	90c	55c	1.25	52c
Andes	50c	45c	45c	35c	50c	40c	35c	30c
Albion	1¼	1.60	1.70	1.35	2.15	1¼	2.60	1.70
Argenta	15c	....	15c	....	20c	....	30c	20c
Addenda	....	....	....	....	....	....	....	....
Belcher	30c	....	35c	25c	35c	25c	25c	....
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	4.95	4.15	4.45	3.50	4.90	3.65	4.20	3.35
Bullion	25c	20c	20c	10c	10c	5c	10c	5c
Bechtel	15c	....	15c	....	....	....	15c	....
Belle Isle	10c	....	10c	....	10c	5c	25c	15c
Bodie	5½	5	5	4.95	5¾	4 90	5¾	5¼
Benton	30c	....	35c	5c	15c	10c	30c	10c
Bulwer	1.95	....	2	1.30	1¾	....	1.95	1¾
Boston	20c	....	....	....	....	....	....	....
Bank Hawk	10c	....	....	....	....	....	....	....
Bodie Tunnel	1.10	1.05	1.20	1.05	1¼	1.20	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	....	....	....	....	....	....	....	....
California	20c	15c	20c	10c	20c	15c	20c	5c
Challenge	....	....	....	....	150	....	10c	....
Chollar	40c	35c	37c	22c	35c	15c	60c	50c
Confidence	55c	50c	50c	....	40c	....	55c	50c
Con Imperial	....	....	....	....	....	....	....	....
Con Virginia	50c	45c	45c	30c	45c	30c	40c	35c
Crown Point	42c	....	40c	....	42c	30c	30c	25c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	1	....	....	....
Cen Pacific	....	....	....	....	....	....	....	....
Deseec	1.95	1.85	2	1.35	1.85	1.70	1.80	1.65
Dey	10c	....	15c	....	10c	....	10c	....
E. Mt. Diablo	18½	16½	16	15¾	17½	15	15½	13¾
Eureka Con	45c	....	25c	10c	....	....	10c	....
Eureka Tunnel	15c	10c	15c	10c	10c	....	15c	....
Exchequer	50c	45c	45c	30c	45c	30c	40c	35c
Endowment	10c	5c	10c	5c	20c	15c	25c	20c
Grand Prize	42c	....	40c	....	42c	30c	30c	25c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	25c	20c	25c	20c	20c	....	15c	....
Gould & Curry	1.90	1.60	1.70	1.30	2	1.35	1.70	1.40
Hale & Norcross	70c	30c	60c	25c	60c	25c	50c	35c
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	10c	5c	....	....	....	....	10c	....
Justice	25c	10c	15c	5c	10c	5c	10c	5c
Jackson	....	....	....	....	....	....	....	....
Juniper	....	....	....	....	....	....	....	....
Kentuck	15c	....	20c	....	....	....	20c	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	10c	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	3½	....	3.80	....	3.90	3¾	4.15	4
McClinton	....	....	....	....	....	....	....	....
Meno	1.15	....	65c	50c	1¼	50c	1.15	1.05
Mexican	5¾	4¾	5¼	4.70	5¾	5	5¾	4.90
Mt. Diablo	4	....	4¼	....	4¼	....	4.10	4
Mt. Potosi	40c	....	65c	....	....	....	50c	....
Noonday	1	95c	1	95c	1	1.90	1	95c
New York	....	....	....	....	....	....	....	....
Northern Belle	7	6¼	8	7¼	7¾	....	7¾	8	7¾
North Noonday	1	....	90c	70c	85c	75c	90c	80c
Navajo	2¼	2.10	2¼	2.15	....	....	2.35	2.70
Occidental	85c	....	75c	....	....	....	....	....
Ophir	3	2.45	3¼	2.55	2.75	2.45	1.70	2.45
Original Keystone	....	....	....	....	....	....	....	....
Overman	50	....	5c	....	25c	....	45c	....
Oro	15c	10c	20c	15c	15c	....	15c	....
Paris	....	....	....	....	....	....	....	....
Potosi	55c	45c	50c	40c	55c	35c	45c	40c
Pinal	3	2.90	3.90	3.20	3.40	3¼	3	2.80
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	90c	55c	55c	30c	1.10	20c	85c	80c
Seg Belcher	2	....	....	....	....	....	....	....
Sierra Nevada	6	5¾	5½	5¼	6	5¼	5½	5
Silver Hill	10c	....	10c	5c	5c	....	....	....
Silver King	17½	16½	16¾	16¼	16½	16¼	17¼	....
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	20c	....
Scorpion	75c	65c	70c	50c	65c	10c	60c	30c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	10c	....	....	....	....	....
South Nevada	6¾	6¼	7¼	7	6¾	....	6¾	....
Syndicate	15c	....	15c	....	15c	10c	10c	....
Tioga Con	15c	....	....	....	10c	....	....	....
Tiptop	....	....	2¼	....	2¼	2¼	....	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	10¼	9¼	9¾	9	10¼	9¼	9¾	9
Utah	2.30	2	2.10	1.05	3.70	1.15	3	2.80
Ward	3¾	....	3¾	....	3¾	....	....	....
Wales	45c	40c	40c	....	45c	40c	....	....
Yellow Jacket	75c	65c	75c	25c	65c	45c	60c	50c

Sales at S. F. Stock Exchange.

Thursday A. M., Jun 15.

780	Alta	95c@1	
20	Alpha	70c	
350	Belcher	25c	
35	Bullion	10c	
160	Benton	10c	
100	Challenge	10c	
300	California	10c	
100	Con Virginia	35c	
450	Chollar	60c	
380	Confidence	50c	
50	Exchequer	10c	
110	Gould & Curry	1.55	
220	Hale & Nor	35c	
160	Justice	10c	
100	Kentuck	20c	
1,15	Mexican	5½@5¾	
300	Ophir	2.65@2.70	
200	Potosi	40c	
860	Savage	80@85c	
275	Sierra Nevada	5¾	
50	Scorpion	5c	
135	Union	9¾@9¾	
30	Utah	2.90	
100	Yellow Jacket	50c	

AFTERNOON SESSION.

1700	Argenta	25@20c	
900	Albion	2.40	
540	Alta	1	
70	Bodie	5¾@5¾	
20	Bulwer	1.75	
400	Bodie Tunnel	1.25	
50	B & Belcher	4.10	
70	Conndence	50c	
500	Independence	30c	
20	Mt Diablo	4.10	
440	Mexican	5¾@5¾	
400	Northern Belle	7¾@8	
700	Navajo	2.75	
100	Noonday	95c	
500	Oro	15c	
100	Ophir	2.65	
500	Potosi	35c	
50	Silver King	17¼	
30	S Nevada	6¼	
100	Savage	85c	
50	Utah	2.95	
190	Union	9¼	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Horn Silver, June 8th, $25,000; Mammoth, 8th, $4,500; Alice, 8th, $11,207; Monltou, 8th, $11,520; Frisco, $24,448; Germania, 10th, $2,200; Hananer, 10th, $2,100; Overland, 10th, $1,585; Contention, 3d, $15,857 84; Northern Belle, 8th, $12,249 95; Bodie, 12th, $8,313; Star, 5th, $3,637.58; Christy, 12th, $2,184; Silver King, 6th, $12 000; Bodie, 9th, $1,562 54; Contention, 10th, $38,551; Christy, 13th, $2,327; Eureka Con., 4th, 5th and 6th, $15 492.86; Bodie Tunnel, 14th, $3,837; Gold Hill (Quartzburg), 3d, $15,000.

THE *Tidings'* Truckee correspondent says, under date of June 8th, that 80 head of stock, consisting of horses and mules, arrived in Truckee on Thursday, the 8th, from the State of Nevada. Their owner has taken one of the largest hauling contracts that has ever been let in that section of the country. He is to haul during the season, for the Truckee Lumber Co., 5,000,000 ft. of logs.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	23	50	May 2	June 6	June 27	W H Watson	302 Montgomery st
Boston Con M Co	California	3	20	May 23	June 28	July 20	F F Luty	310 Pine st
Belmont M Co	Nevada	32	10	May 20	June 24	July 17	J W Pew	310 Pine st
Benton Con M Co	Nevada	8	20	May 27	June 13	July 21	Wm H Watson	302 Montgomery st
Bullion S M Co	Nevada	24	25	May 29	July 1	July 25	A J McDonnell	327 Montgomery st
California M Co	Nevada	4	10	June 10	July 18	Aug 16	C P Gordon	309 Montgomery st
Chollar M Co	Nevada	8	25	May 9	June 12	June 30	W E Dean	309 Montgomery st
Excelsior Gray M Co	California	18	25	May 4	June 6	June 23	D B Chisholm	327 Pine st
Fair Vila M Co	Arizona	1	2½	Apr 24	May 29	June 19	J H Sayre	330 Pine st
Gould & Curry S M Co	Nevada	42	50	May 23	June 29	July 21	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	74	50	May 16	June 20	July 11	J F Lightner	309 Montgomery st
Head Center Con M Co	Arizona	3	20	May 25	July 6	July 28	J W Pew	310 Pine st
Homer M & M Co	California	2	20	June 1	July 5	July 31	F E Luty	330 Pine st
Justice S M Co	Nevada	36	20	May 22	June 27	July 18	R E Kelly	419 California st
Martin White M Co	Nevada	12	25	May 9	June 20	July 20	J J Scoville	309 Montgomery st
May Flower Gray M Co	California	16	10	May 31	July 6	July 26	J Morizio	328 Montgomery st
Mexican G & S M Co	Nevada	19	50	June 6	July 11	July 20	C L McCoy	309 Montgomery st
Mono G M Co	California	17	20	June 2	July 7	July 27	G W Sessions	309 Montgomery st
Napoleon M Co	California	8	5	Apr 20	June 1	June 19	H Smith	307 Montgomery st
Norwich G & S M Co	California	1	20	June 5	July 10	July 31	A L Perkins	310 Pine st
North Could & Curry	Nevada	3	25	June 7	July 10	July 31	C H Mason	331 Montgomery st
Overman M Co	Nevada	53	25	May 1	June 6	June 27	G D Edwards	414 California st
Quartz Moutain M Co	California	14	75	Mar 16	May 24	June 24	E Hestres	729 Montgomery st
Savage M Co	Nevada	51	50	May 4	June 6	June 26	E B Holmes	309 Montgomery st
San Pedro G & S M Co	Nevada	5	10	May 10	June 12	July 10	W G Holmes	Sherman's Building
Scorpion S M Co	Nevada	12	10	May 25	June 29	July 21	Geo R Spinney	310 Pine st
Sierra Nevada M Co	Nevada	73	1 00	May 17	June 21	July 10	E L Parker	309 Montgomery st
Silver Hill Q M Co	California	2	25	Apr 12	June 10	July 10	J W Pew	310 Pine st
Villagrana M Co	Lower California	1	20	Apr 25	June 26	July 15	A Judson	320 Sansome st
Utah S M Co	Nevada	1	00	May 4	June 10	June 29	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Belle Isle M Co	Nevada	4	10	May 23	June 23	July 17	E M Hall	327 Pine st
Pioneer Con M Co	Nevada	6	10	June 9	July 19	Aug 7	J M Buffington	309 California st
South Hite G M Co	California	4	10	May 3	June 5	June 28	F A Berlin	420 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Aloha Con M Co	Nevada	Wm Willis	309 Montgomery st	Annual	June 19
Bodie Con M Co	California	G W Sessions	309 Montgomery st	Annual	June 19
Excelsior Gray M Co	California	D B Chisholm	327 Pine st	Annual	June 30
North Belle Isle M Co	Nevada	E M Hall	327 Pine st	Annual	June 28
Santa Anita M & M Co	California	J M Buffington	309 California st	Annual	June 26
Union Con S M Co	Nevada	J M Buffington	309 California st	Annual	July 17

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	June 12
Contention M Co	——	D C Bates	309 Montgomery st	25	May 27
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	May 27
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Apr 11
Silver King M Co	Arizona	J Nash	315 California st	25	June 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	June 12

The Mining Share Market.

The market is rather dull yet. The only spurt this week was that in Albion, as our tables show: As stated in a dispatch, the Richmond injunction against the Albion has been dissolved and the latter can now extract ore from the ground in dispute. This explains the sharp advance.

As to the Comstock situation, the *Enterprise* says: At almost any other time in the past 10 years the present developments and outlook at the north end would have caused quite a boom, but at present they hardly cause a ripple in the current of the market.

The stopes on the 2500 level of the Union Consolidated are looking well, and the yield (with a small amount of ore taken from the 2600 upraise) will be about 700 tons. The yield of the mine for the past month was $91,800.48. The raise from the 2600 will be carried up into the 2500 stopes, in order to secure a circulation of air, when stoping will be commenced from the 2600 level.

The winze on the 2700 level of the Mexican is down 23 ft. It is in the vein material of the ore channel. Streaks of ore are cut in it which are going straight down, showing a change of dip at this point. The indications at present are that it will not touch the ore body, 12 ft. east of which it was sunk. The west cross-cut on the 2900 level has been advanced about 30 ft. during the week in a mixture of quartz, clay and porphyry. A joint Ophir winze is about to be commenced on this level. The station is being cut out, and will be completed next week. This will be a first-class winze, and will be sunk to the 3000 level; indeed, to the 3100 level, if water does not prevent the attainment of that depth.

At the Best & Belcher and Gould & Curry joint shaft they are cutting out a tank pit at the 2500 level, and will soon be ready to commence drifting at that depth.

The Savage folks are exploring promising sections of their 2200 and 2400 levels, by drill and by drift, and with good indications of finding a paying deposit of ore.

The middle mines are awaiting the sinking of the Chollar-Norcross-Savage shaft to the 2600 level. This shaft is going down at the rate of nearly 30 ft. per week, and will soon reach the level named. Connection with the shaft at this depth will allow of the middle mines being very rapidly and economically drained.

LEAVING WOOD RIVER.—The Wood River *Times*, of June 2d, says: Forty-five men started out of Bellevue on foot, and packing their blankets on their backs, yesterday. All of 20 followed their example to-day, and more will probably do so for some time. The fact is, that there are too many laborsrs for the labor that there is to do; and this state of affairs will continue until the railroad gets within reaching distance, at least. The *Times* and *News* repeatedly warned men without means to keep away from here. The wisdom of the advice is now apparent. The country will doubtless give employment to thousands of men in time, but that time has not come.

Eagle Mining District, White Pine Co, Nevada.

EDITORS PRESS:—This district has been known to a few prospectors for a number of years. But all muscle and no money does not develop as extensive a mineral district as this is very rapidly. Prospectors are very free to acknowledge that they never saw as many and as fine mineral-producing ledges in one district as are to be seen in Eagle mining district. The Recorder's books show that there are more than 300 locations recorded. The ledges are from 10 inches to 200 ft. in width. Some true fissure veins are traceable from three to nine miles. The ore is free milling argentiferous galena, and quite a number of other varieties of silver, gold and lead ores. We have wood in abundance in all parts of the district, and a good supply of water. The formation is mostly granite, the remainder being lime. There are as fine opportunities for men who have a few thousand dollars to use in the completion of the development (which is now far advanced) of some first-class locations here, as were ever offered to men. A miner who has some 11 locations of 1,500 ft. in length, by 600 ft. in width, and has worked hard for more than eight years, in running tunnels in and sinking shafts on them, offers the 16,500 ft. of ledges, five houses, one of which is 16 ft. by 36 ft., all hewed logs, and cost $1,100 when built, and complete outfit of mining tools—all for $30,000 cash. With a little money properly expended the property could be made to bring ten times the amount. He has three locations in granite, on the first of which he has run a tunnel in 100 ft. to the ledge, and drifted on the ledge 80 ft.; ledge at face of drift is six ft. wide. Second location granite; has four ledges on it, varying from ten inches to five ft. in thickness; all ore. He has run a tunnel in this 255 ft. through very hard rock, and used 40 kegs of black powder, besides a large amount of giant. When in 75 ft. farther will tap the ledges 150 ft. deep. The ore assays, at Salt Lake City, $40 in silver, $4 in gold, and 33% lead. He has two locations in lime formation; one ledge six ft. thick, the other four ft. thick. He has sunk 65 ft. on both. The one that has a ledge six ft. wide produces ore that resembles the Star ore of Cherry creek, assaying from $20 to $50 per ton. Another one in lime; he has a shaft down in the gouge on the foot wall 110 ft., and a crosscut 43 ft., but has not got to the hanging wall yet. Ore from this mine has assayed $190 per ton. Another in lime; shaft 32 ft.; drift from bottom of shaft 12 ft. So far he has worked in broken ground, but the ore vein appears to be two and one-half ft. thick, though the ledge is 200 ft. wide; ore free milling, and assays about $100 per ton. Another in lime has a shaft down 20 ft.; ledge four ft. wide; ore mills $200 per ton. He courts a thorough investigation by all who wish to invest in mining property. Our post office is Shelhourne, White Pine county, Nevada. W. D. MALLORY.

WE are glad to hear that Wood River ore is meeting with a ready sale in this market, and will soon begin to arrive in large quantities. McCornick & Co. have just made a sale of 100 tons of Jay Gould ore, and also 200 tons of Mayflower, all of which is to be delivered as soon as possible.—*Salt Lake Tribune.*

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

THE GINOCCHIO MINE.—*Dispatch*, June 10: The parties who bonded the Ginocchio mine, near town, have gone to work in good earnest, and intend developing the mine as rapidly as possible. Shifts are being run night and day, and we understand they have already struck some fine looking rock, but it will probably be some time before anything definite can be ascertained as to extent and richness of the ledge.

THE TELLURIUM.—A clean-up was made at the Tellurium mill, near Pine Grove, last Tuesday. The amount of ore crushed during the run was about 80 tons, and the yield was a fraction over $16 to the ton. This is a very encouraging result, and as there is an abundance of this kind of ore in the mine, the company have concluded to add 5 more stamps to their mill as soon as possible.

MISCELLANEOUS.—*Ledger*, June 10: The Tellurium mill has lately crushed 80 tons of ore from that mine near Pine Grove, and we are informed by the millmen that it averaged about $16 per ton. The mill has only 5 stamps, and is too small to work the mine to advantage. The property is idle at present, but is expected to start again in a few days. The Consolidated Amador mill at Sutter Creek has been running 30 stams, and more men have been employed at the mine. Hoisting machinery has been purchased for the South Spring Hill, and work is to be resumed at once. The water is all out from the Jackson mine, and sinking is in progress. Samples of rock broken from the 4-ft ledge this week are said by experts to be of excellent quality and prospect well.

BUTTE.

BUTTE RECORD.—Cor. Butte *Record*, June 10: Mr. D. King has taken Pres Longley's claim, on Sycamore flat, to work on shares. Mr. Hedges has hired the Shepherd ditch water and is making big pay, working night and day. The claim of John Hupp has made a good clean-up of $3,000 for three weeks' work, and Hupp and his brother are quite happy. The celebrated Cole claim has discharged all its men but 5, there not being water sufficient to wash all the dirt for so many men. Mr. Crow, the efficient superintendent of the Mammoth tunnel, has got 400 ft under the lava, but has not struck the gravel yet. Capt. Moss, of the Butte Creek Hydraulic Co., has moved to Whiskey Flat to operate, where he hopes to strike a big bonanza. Billy Beauman and Joe Rice have a claim that is paying $8 per day to the man. Jim and John Foley, after prospecting for many years, have struck pay at $5 per day.

EL DORADO.

NEW MINING ENTERPRISE.—*Mountain Democrat*, June 10: A. J. Burnett, former superintendent of the Ætna mine, has organized a new company, entitled the "Brass Wire Deep Gravel Gold Mining Co.," and will soon commence work. The mine is on Coyoteville hill, to which he is leading water from Cedar creek, having already laid over a quarter of a mile of new pipe. He is now cutting a ditch which will carry the water 150 ft higher on the hill than ever before. Mr. Burnett is a careful, skillful, painstaking and reliable miner, and anything he undertakes to do he does well.

COOD PAY.—Georgetown *Gazette*, June 4: S. C. Adams has leased one-half of the Rich Gulch mine from A. Baldwin for one year from June 12th. Mr. Armstrong will continue to work his half interest. Mr. Adams starts in with a most favorable showing. Mr. Baldwin retires with the snug little sum of $10,000 or $12,000, which isn't bad for a month's work.

ST LAWRENCE.—Cor. El Dorado *Republican*, June 8: The Amherst mine is being opened by Mr. Lee. A fine pocket was taken out of this mine last spring, since which time, until very recently, work was suspended. The mine is looking very well, and indications are favorable for another good raise. I was shown some very fine-looking ore, and there was more in sight of the same sort. The Cincinnati mine is another fine-looking property, having a shaft 100 ft in depth, ledge large and well defined; the ore on the dumps looks well, showing free gold. The next mine visited was the Gold Deposit. There is a good 10-stamp mill, hoisting works, etc. The mine has not been in operation for about 2 years. I was informed the shaft had been sunk about 80 ft, and some very rich ore extracted. The Big Sancho mine is located about 300 yards above the Gold Deposit, and is supposed to be an extension of the St. Lawrence vein. A tunnel has been run about 100 ft along the ledge, and the ore prospects well the entire distance. At this time a crosscut is being run to ascertain the width of the ledge, when, if satisfactory arrangements can be made, the ore will be crushed at the Gold Deposit mill. This mine was located last September, and has been under bond to an Eastern party for the past 4 months. The owners appear gratified that the mine was not sold, as the price to be paid can soon be extracted from the ore now in sight. The owners are Messrs. Ball, Burlingham & Newbery. The Lone Jack mine, another good property, located about one-quarter of a mile east of this place, St. Lawrence, is looking well and paying well; it is a seam mine, but is being worked in a different manner from the usual working of mines of like character—the quartz being saved and crushed, the owner, Mr. Jensen, having a small stamp mill at the mine for that purpose. I am informed that he makes more than his expenses from material that was formerly sent on its way to the cow counties. The Old Judge, an extension of the Lone Jack, is at present under a cloud and idle. This mine has produced large quantities of gold, being known as the Daggett mine, will, I hear, be in operation some time in July. There are several other good prospects in this vicinity.

INYO.

RUNNING.—*Independent*, June 10: Mr. Chalfant now has the Brown Monster mill in operation, at least one battery of the same. The high state of the river has occasioned him some considerable trouble in keeping the 6-mile head race in water-carrying condition, but, barring delays from that source, the mill will be kept running steadily for an indefinite period.

MARIPOSA.

MORNING STAR.—Stanislaus *News*, June 10: The Morning Star Gold Mining Co. has been organized at this place. The company has secured the title to a quartz mine formerly owned by Philip Gosser, located at the head of Sebastopol gulch, south of Mariposa creek, in Mariposa county, near to, but west of the Mariposa grant. We have been permitted to see a report of the committee who examined the mine, and negotiated for its purchase. We have also seen some splendid specimens of free gold-bearing quartz found on the claim. The company intends to erect machinery at once and open up the mine. We notice the names of Messrs. Walthall, Beckman, Wells and Briggs attached to the report. The owners have every confidence they are in possession of a valuable mine.

BLUE MINE.—Mariposa *Gazette*, June 10: In company with Mr. John R. Bothwell, of New York, who was spending a day in Mariposa, on Monday last, we took a horseback ride out to the Diltz mine, and finding no one at home, except the Captain's oriental cook, we pursued our way until we struck the new wagon road, which is in course of construction from the mine to a timber belt about 2½ miles distant. After following the graded road about 2 miles, we found the Captain with a force of men hard at work grading and removing rock and trees, filling up hollows and laying the foundation for a work of incalculable value to his extended plans, and the future growth of mining interests in that whole section of country. This road will open an avenue to a large belt of timber which has hitherto been inaccessible. Along the line of the road the Captain contemplates a continuous line of pipe to convey water from lasting springs to his

mine and mill. The Captain accompanied us upon our return back to his home at the mine, where a few moments were spent in resting and showing Mr Bothwell the outer works of the mine, for it was too late in the day to examine the tunnel and shafts, and return home before night. As it was, Mr. Bothwell declared himself pleased with what he saw, and judging from the great amount of surface mining that had been done, he thought it was evidently a valuable mining property. The afternoon's ride with Mr. Bothwell seemed to be an enjoyable one, and about as severe as 200 lbs in the saddle could well endure in the time taken and the distance traveled.

MONO.

LUNDY.—Bodie *Free Press*, June 10: Work in the May Lundy mine has been started up for the season under the supervision of M. B. Kellogg, one of the owners of the property. The mill is now in operation. Quite a force of men are also at work on the Gorilla mine, and another force will soon be employed at the recently incorporated Silver Group mines. Considerable work of less importance is being done on other claims. The Great Sierra Co.'s operations in Tioga district are a great benefit to Lundy. At the mouth of Mill Creek canyon and between that point and Mono lake, the Mono Lake Hydraulic Co. are now operating upon a pretty extended scale, and the result of their labors is likely to excite great attention to hydraulic mining in that neighborhood.

NEVADA.

NOTES.—*Tidings*, June 10: There is very little to be said in the mining line this week. All the prospects look well, and the regular mines are turning out their monthly dividends.....The hoisting works at the East Eureka have been running all the week, and the work of cleaning out and repairing the shaft is being rapidly done. The mill is about completed, and will start up on Monday next.....The Washington is looking exceedingly well, the ledge in the breast of the north drift being 34 ft thick, and the rock shows well in free gold and heavy sulphurets. A contract will be let to-morrow to run the north drift in 100 ft further.....The Ford & Mullen keeps up its regular lick of turning out specimens. Several boxes of very rich ore have been deposited in the vault at Judd's store, during the past week.....The Empire is looking better than it has ever looked, and the mill is kept running day and night on excellent milling ore.....Work at the Nevada mine, located on Ophir hill, adjoining the Empire, is being pushed forward with diligence. Another crushing will soon be had.....The shaft at the Maryland is now down 130 ft, and is mostly in ledge matter. It will not be long before the ledge is reached. .....No particular change in the Idaho since our last report. The ledge in the 12 and 13 levels looks as well as ever. It will be about 4 months before the 14 level is opened up.....No water has yet been found in the Imperial. The shaft will be sunk to water level and then the ledge will be again cut and another crushing taken out. .....The Champion Co. are making an upraise in their east crosscut. They are working 2 shifts in the west crosscut. The Champion Co. expect to reach the ledge in about 100 ft further.....The Nevada City mine will be run entirely by water power in a short time. Water from the South Yuba Canal Co. is now being brought into the hoisting, pumping and mill works. Steam will be done away with entirely. Ten stamps mill soon be added to the mill.

O'CONNOR MINE.—Grass Valley *Union*, June 10: The mill and hoisting works on the O'Connor mine have been put in complete repair, except that the mill batteries are not quite ready. The pump and hoisting shaft has been cleaned out and retimbered where necessary, and in a few days the pump will be put in preparatory to pumping out which will take but a short time, when a drift will be started to open up the ledge. For several months past companies of tributers, numbering 20 men, have been raising rock along the croppings of the ledge, and have now a large quantity ready for the batteries as soon as the stamps commence dropping. Some of this rock looks very well, and it is expected to give good results, while all of it, it is believed, will pay the expense of mining and milling. It is the intention to do custom work at the O'Connor mill, and the Washington company will mill all their rock there, as the haul will be shorter than to any other in the district. The prospectors on Greenhorn creek, and all other prospecting in the north-eastern portion of the district will also avail themselves of the same facilities, and the result of the starting up of the mill will be to stimulate prospecting in all the country in that part of the district.

HARTERY MINE.—Work upon the Hartery mine has been resumed, after a suspension of some months, and will be conducted under the superintendency of Stephen Moore, formerly superintendent of the North Star mine, who is a miner of many years' experience. For some days past the pumping and hoisting machinery has been in process of the necessary repair, and is now about ready to start up. The drain tunnel, which was badly caved on account of the mine standing idle for many years, was opened last season, and the mine completely drained down to the tunnel level. The old shaft was partially reopened at the same time, but, before reaching the drain level, work was suspended; owing to some complications in the company affairs. The shaft will now be opened in good shape, the mine pumped out, and the extraction of quartz commenced as soon as practicable. The company now operating the mine consists of San Francisco and Eastern men and is understood to be on a good financial basis. The Hartery has not been worked in many years, but at one time was regarded as one of the most promising mines in the district, and is yet considered a desirable property, owing to its situation on the rich gold belt between Massachusetts hill and the famous old Allison Ranch mine.

PLACER.

MICHIGAN BLUFF.—Placer *Argus*, June 10: Bob Lewis and Owen Griffiths, owners of the Damascus cement mine, which adjoins the Mountain Gate claim, are reported to have lately struck rich pay—half an ounce to the man. The Mountain Gate mine is also said to be doing very well.

PLUMAS.

ROBERTSON MINE.—Oroenville *Bulletin*, June 7: About 15 years ago prospectors found a ledge on the mountain east of Genesee valley that looked well, but after doing a small amount of work they abandoned the place. At that time there were no mills within a long distance of the place; roads were very bad, and but little attention was yet given to quartz mining in that region. Prospectors being then more intent on finding gravel diggings. Nothing more was done with the claim till last fall, when C. Robertson and L. Lester relocated it and ran an incline in the vein to a depth of 60 ft; all that distance it opened out well, keeping an average width of something over 2 ft. About a month ago a quantity of the ore was sent for assay and was found to contain $553 gold per ton, and $67 50 of silver. The nephew of Mr Robertson, James Stromberg, has lately become a partner in the mine and the owners are now making a road from the highway to the mine; when this road is completed machinery will be hauled in and a mill built as rapidly as possible. The facilities for mining and milling are all that could be wished; timber and water are abundant.

BUSHMAN CLAIMS.—Plumas *National*, June 10: Since Messrs. Munson & Corbin have leased those well-known claims on the head of Blackhawk, considerable improvement has been made. The pumping machinery at the old incline has been repaired and put in order, a new flume and dump built, and a force of men are now at work opening the ground at the foot of the incline. They are probably in pay gravel by this time, and are certain to find some coarse gold and probably "coarse pay." Work will soon be commenced down the creek some distance, to open the channel by a tunnel, and the Bushman claims will be a busy place during the summer.

GOOD QUARTZ.—On Wednesday Mr. L. L. Cariepy brought us some fine specimens from a ledge which he is opening, about four miles north of Genesee valley. He calls it the "Old Magpie Ledge." It is about four ft in width, and prospects well in free gold, besides carrying a large percentage of copper and silver. The rock is heavy and evidently valuable. A nice specimen can be seen in the *National* cabinet.

SIERRA.

STARTED.—*Mountain Messenger*, June 10: Mr. Hewson, of the Good Hope quartz mine, started his 20-stamp mill last week. With the exception of a few slight drawbacks incident to new machinery, the mill worked splendidly. This week the mill has been running steadily on excellent rock. Mr. H. will undoubtedly make a success of this mine.

NOTES.—The old Alaska quartz mine at Pike City is paying handsome dividends to the owners. The company have a splendid 20-stamp mill running continuously. Mr. Burke, superintendent of the Golden Gate, informs us that he expects to commence work on the mine in a short time. R. D. Williams, of Jim Crow, was in town this week. He is recently up from Nevada county, and is getting things fixed to put a crusher on his quartz mine in the canyon. The mill is new style and was described in the *Messenger* several weeks ago. The Rainbow company at Chip's flat, are grading for a mill on the bank of Kanaka creek. It is proposed to carry the ore from the mine to the mill by a Halliday wire tramway, viz: A series of buckets on a wire rope traveling in a circuit; the rope being supported by wheels attached to posts. This will be a very cheap and reliable manner of transporting the ore. The distance is about 1,700 ft.

BLACK JACK.—This mine, located on Jim Crow canyon, became the property of John B. Johnston, banker of New York City, by redemption of a judgment and sale of property prosecuted by Charles Heintzen, of Forest City. The old company came to grief not from any fault of the mine, which is considered by competent judges a good property, but from faulty management. The new owner proposes to at once open and develop the mine, avoiding, if possible, the mistakes made by former owners.

TRINITY.

PROSPECTING.—Trinity *Journal*, June 10: Mr. Joseph Eastman, late of San Bernardino county, accompanied by M. D. Butler and son, formerly of Cinnabar, in this county, arrived here this week on a prospecting tour and propose to commence operation in the hills surrounding Weaver Basin. The particular thing they are looking for is what is known as seam or pocket diggings, in the search for which Mr. Eastman has of late been quite successful in Shasta county. He tells us that indications hereabouts appear very favorable, and should he find some good pockets here, it will doubtless stir some of our own folks up to the prospecting point. No pockets or seams have ever been looked for in this county that we are aware of. Success to the prospectors.

LOOKING AT MINES.—A party arrived this week consisting of Messrs. Oscar Townsend, a railroad magnate of Cleveland, Ohio, M. C. Fox, a prominent mining operator, of Salt Lake, Utah, and H. H. McClellan, of Placerville, El Dorado county, Cal. These gentlemen are here to inspect mining properties with a view to investment and we hope they may find satisfactory inducements.

ANOTHER FATAL MINING ACCIDENT.—Last Tuesday, about 1 o'clock in the afternoon, the ground in Coyle's drifting claim, above Trinity Center, suddenly fell, caused by the giving way of a false set of timbers. At the time, Jos. Lawton and Jas. Dockery were working in the drift and Charley Osgood—who had been working a short distance from them—was sitting near them, having left his work for a short time to allow the pump to drain the bedrock. In the first fall, which came without warning, all started to run, but the lagging and wet sand caught Osgood's foot and leg and held him fast. The others returned and attempted to pull him out but could not do so, and the dirt kept falling so fast that they were compelled to abandon him and run to save their own lives. The alarm was at once given that Charley Osgood was caved upon and 9 men started to work with a will to dig him out, working 3 at a time. It was not, however, until near 11 o'clock at night—10 hours after the first cave—that they came upon his lifeless remains, he having been literally crushed to death.

TUOLUMNE.

MINES.—Tuolumne *Independent*, June 10: The Blagg mine, situated at Dear Flat, is looking splendidly. Some of the richest gravel ever seen in the southern mines has been uncarthed, and the boys are in high spirits. The Tioga claims are again coming to the front. A number of owners of claims in that district are going over next week. Austrians are still taking it out at Brown's Flat. The Stayton Bros. and Wm. Bell, of Columbia, have entered into a contract with J. T. Murnan and Geo. McQuade, to work the latter gentlemen's claim—a quartz claim—situated one-half mile south of Sonora, and which is said by experts to be a promising lode.

NEVADA.

WASHOE DISTRICT.

UNION CON.—*Enterprise*, June 11: Are stoping out ore on the 2500 level. On the 2600 level the west crosscut has been extended 20 ft and the upraise 15 ft. South drift No. 2 on the 2700 level has been advanced 25 ft. During the week 736 tons of ore have been extracted, and 928 tons and 180 pounds have been sent to the mill. Amount of bullion shipped during the week, $87,180.95.

CONSOLIDATED VIRGINIA.—The joint California east drift on the 2700 level has been advanced 16 ft. The joint west drill hole, on the same level has been advanced 160 ft.

MEXICAN.—West crosscut No. 2 on the 2760 level has been extended 24 ft, and winze No. 1 sunk 20 ft. On the 2900 level west crosscut No. 1 has been advanced 19 ft. Are cutting out on this level for a joint Ophir winze.

CALIFORNIA.—The main south lateral drift, on the 2700 level, has been advanced 19 ft. The joint Consolidated Virginia east drift has been extended 16 ft. The joint west drill hole, on the same level, has been advanced 160 ft.

OPHIR.—On the 2900 level the main south lateral drift has been extended 16 ft, and is now being timbered up. Are cutting out a station for a joint Mexican winze. During the week 97 tons of ore have been extracted from the croppings.

SIERRA NEVADA.—Winze No. 2, down from the 2500 level, has been sunk 6 ft. On the 2700 level main north drift No. 1 has been extended 27 feet; north drift No. 3, 7 ft, and the west crosscut, from north drift No. 3, 20 ft. Are repairing winze between 2300 and 2400 stations.

SUTRO TUNNEL.—Main tunnel, repairs, 2300 to 2700. Two repairmen were employed 6 days of this week on main tunnel repairs. They repaired 400 ft of the track, put in 3 posts and lagged up 5 sets; also, braced down the boxes at point 11 000. The flow of water is equal to 0,650,137 gallons per 24 hours.

BELMONT DISTRICT.

EMERSON'S MINE.—Belmont *Courier*, June 10: Work progresses finely in George W. Emerson's mine. They are now sinking on the ledge, and a tunnel is also being run to tap the front ledge at a depth of 35 ft. Mr. Emerson feels confident that he will soon be able to extract chloride ore in large quantities. During the present week many improvements have been made to his mill. He has now a plentiful supply of water for steam and leaching purposes. Mr. Emerson will commence to roast ore to-day or to-morrow. Work is progressing rapidly in the Monitor-Belmont mill, and Superintendent Fassett is having ore hauled from the Belmont mine to the mill.

BRISTOL DISTRICT.

DAY FURNACE.—Pioche *Record*, June 3: The Day furnace is in the best of order. Foreman Dick Walsh, one of the most experienced furnace men in this State, has spared neither labor or expense in placing it in this condition for the coming run. Everything about the premises is as neat and tidy as possible—in fact, could not be more so. When the furnace starts up, Foreman Walsh is going to surprise the natives by the vast quantity of ore he will shovel into it and the large stacks of rich bullion he will take out. Long may she wave.

NOTES.—The Bristol Mine is working along as usual. Of late the working face at the Mayflower has been greatly reduced—some of the men being discharged and others quitting on their own account—but the mine is now being worked into shape. They are now doing work that ought to have been done in the first place, and would have saved the company considerable inconvenience, and was so advised by Charles Roe and Foreman McQuaig, but their advice was not accepted. The company is now working as economical as possible. The mill is running as well as can be expected under present circumstances. The teams hauling ore from Royal city, and a few loads coming in from Highland and Pioche, together with the coal teams, gives Bristol a lively appearance, but there is not any money to be had. The engine at the Tempest mine was completed a week ago and commenced running then. The work of timbering the shaft is drawing near completion. A force of 8 men is employed at the mine. Men wishing to obtain employment will do well to keep clear of Bristol. The little engine placed on the Tempest mine was packed up there on mules. There is not as much prospecting going on at the mines in this district as there has been.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, June 10: Advantage has been taken of the grading and removal of the ore bin by the railroad company to make some repairs to the hoisting machinery. It was stopped for four days, during which time the work on the fifth shaft level was suspended. In consequence the main drift on this level was extended but seven ft. Its total length now is 192 ft. Work has since been resumed in all parts of the mine and the machinery is running again. The other shaft levels are showing no material change, and looking fully as well as at the time of the last report. The levels above the adit present about the same appearance as last week. Very little work has been done on the ninth level, for the reason that the ore at that point was so easy of extraction, and the stopping of the hoisting works considered, it was thought best to continue such work in the stopes where more labor was required. The ore chutes in the mine are becoming filled up, but will not inconvenience the taking out of ore, as hoisting was resumed yesterday. Mill No. 2 is running steadily and doing its usual good work. The shipments of bullion on May account amounted to $72,071.09. The shipments on the June account to the 8th instant were valued at $12,249 75.

MOUNT DIABLO.—Winze No. 1 is now very nearly 200 ft vertically below the third level. A drift will be started westerly on the ledge. For the last 20 ft no ore has shown but the ground has good indications. The raise from the east drift on the second level, nearly north of the shaft, is yielding a small quantity of ore, assaying from $50 to $75 per ton; the ledge shows strong with small streaks of pay ore. The south crosscut from the east drift on the first level is in 172 ft, and shows coarser ground, with small stringers of ore that look promising. There is no change of note in other portions of the mine.

FLORENCE DISTRICT.

SEDAN.—Belmont *Courier*, June 10: The Sedan mine in Florence district, this county, is looking better and better as work progresses. The shaft is now down 110 ft, at the bottom of which they are extracting ore that assays over $30 in gold and $22 in silver.

JEFFERSON DISTRICT.

LOOKING WELL.—Belmont *Courier*, June 10: The mines at Jefferson continue to look well, and very rich ore is being extracted from the St. Charles, the property of the Harrison Brothers.

LEWIS DISTRICT.

BETTY O'NEAL.—Lewis *Herald*, June 10: The ore bodies in the Betty O'Neal mine still improve, and the mine looks better than ever. The shaft is being sunk and timbered in good shape. The flow of water has increased some as the shaft has deepened, but the pumps handle it with ease. We cannot but agree with Mr. Wm. Oidley, the foreman of the mine, when he exclaimed in answer to our inquiries about the mine: "She's a daisey."

MORNING STAR.—But little work is being done on the Morning Star mine. Work will not be resumed till after the ore has been reduced. About 80 tons of ore will be worked in the Eagle mill, the greater portion of which is now in the mill. The old trail to the mine has been straightened out and about half the distance widened, making a good wagon road. An assay office has been added to the main office under the control of Mr. W. S. Smith, and everything being placed in readiness for starting up in good style.

EAGLE MINE.—The tributers in the Eagle mine have taken out about five tons of first-class ore during the week, making over 20 tons of first-class and nearly the same quantity of second-class. We hear that the ore will be milled as soon as the Dahlgren company clean up in the Eagle mill. Several of the boys are gathering together their picks, drills, etc, and will develop their claims. Notwithstanding the dark cloud overhanging our camp we are satisfied that before next winter we will be able to show the silver lining in the shape of bricks of bullion.

TYBO DISTRICT.

DIFFICULTIES SETTLED.—Cor. Belmont *Courier*, June 10: We have just learned that all the difficulties have been amicably settled between N. S. Trowbridge and the Tybo Consolidated M. Co., and the cloud which has been hanging over the Tybo for the past two weeks has entirely disappeared. It is expected that the mill at this place will start up as soon as Mr. Trowbridge returns from San Francisco, and it will be kept running for some time to come, as there are 1,500 tons of ore on the dump awaiting reduction. The 2-G mine never looked better; there are large quantities of good ore in sight—sufficient to keep the 20 stamps pounding away for a long time to come. The Mountain View M. Co.'s mill will be ready to start up inside of two or three weeks. Their mine is opening out fine as they go down on it, and it will prove a bonanza for its owners. The New Philadelphia at Hot creek, too, is giving some signs of life again, for they have just let a 200-ft contract on one of their mines. The time is not far distant when this section will take a place in the front rank as a bullion producer.

ARIZONA.

REVIEW.—*Epitaph*, June 10: The mining world of Tombstone was not excited by any unusual occurrence during the past week. Everything went along in the usual course. The mines are producing ore, and the mills are turning out bullion. From all quarters we hear of nothing but prosperity, and the managers of the mines are enthusiastic in their belief that Tombstone has yet to see its days of most prosperity. The bullion-producing mines are increasing their yield, and the number of new mines being opened up and developed is considerably augmented since our last. The Randolph is gradually but surely exhibiting its grand proportions. The more this grand mineral deposit is developed the greater seems to be its capacities, and, from present appearances, we should not be surprised to see it take its place in the front rank of the bullion producers of Tombstone at no distant day. The Ingersoll is also making a decided mark in the mining world. Large bodies of high-grade ore have been discovered recently, and the more the work of development is prosecuted the greater seems to be its wealth. The bullion yield of the Grand Central last month was the largest ever turned out by that mine. The same quantity of ore was worked to reach this result as heretofore, so it can easily be seen that the quality of the ore is increasing. There is a general boom among the smaller and less developed mines, and it is fair to assume that ere long there will be more mines worked in this district than in any other in the United States.

TURKEY CREEK DISTRICT.—Prescott *Courier*, June 10: Mr. Theodore L. Chase, superintendent of the Hidden Treasure M. Co., Turkey Creek district, is working 10 miners on two of his New York company's mines, which are pretty well prospected by shaft and tunnel, or rather shafts and tunnels. Mines belonging to the company were, we believe, purchased from McAuliff & Co., men who have done a great deal of hard work in this district, for which they have been partially rewarded.

CAMP CREEK.—*Citizen*, June 10: A. B. Wiley left last Monday for his mines on Camp creek. He informs us that he is down some 45 ft on the Lodestone, with a fine ledge at the bottom. He brought in some fine rock.

THE CASTLE CREEK MINE, owned by Messrs. Roudebush & Campbell, and operated by them as the Castle Creek M. Co., has a 2-ft vein of copper and galena ore, and employs 15 men. We understand that they have considerable machinery at Maricopa, to be used in working this mine.

COLORADO.

KING.—*Reporter-Call*, June 9: The King M. Co. have at last got their working shaft on the King mine cleaned out and timbered up. It was found to be 160 ft in depth. This week levels will be driven. This property has been lying idle for the last 16 years. It is the intention of the superintendent, Mr. F. C. Whitaker, to thoroughly and systematically develop the mine throughout.

MAPLE LEAF.—The owners of the Maple Leaf mine on Clifford mountain have let a contract for the erection of a shaft-building on that mine 20x30, with 14 ft posts, which will contain an improved hoister, 40-horse boiler and a 20-horse power Leidgerwood engines. The present depth of the main shaft is 82 ft. It is 11x4 ft in the clear, and has been timbered up very substantially and conveniently arranged for ladder, pump and skipways. The skip to be used will be capable of containing one ton of ore. Adjoining the Maple Leaf on the west the Clifford M. Co. have received their new Embry table, which is a pronounced success in ore concentration. The table is so arranged as to receive the slimes after being run under stamps directly from the battery and tables. The mill has a capacity of 8 tons per day. The entire management of the mill and table is so conveniently arranged as to permit one man's labor to put through that amount of ore every 24 hours.

CONTRACT FINISHED.—Manning, Briggs & Co. have finished their contract for sinking 100 ft in the working shaft of the Gold Hill M. Co.'s galena lode. The completion of this contract gives the company a main shaftage of 325 ft. The lower workings have materially improved in the last few ft; that is to say, the crevice matter is more mineralized than for some time past.

DAKOTA.

TURTLE MOUNTAIN DISTRICT.—Dispatches from Fargo and Grand Forks, Dakota, say that there is great excitement there over the decision of Secretary Teller, opening Turtle Mountain district in that region. It includes 9,000 - 000 acres of the first land in Dakota, comparatively well wooded and watered, lying to the north and west of Devil's lake. It has been closed hitherto by a claim of a wandering band of Chippewa Indians, which is declared invalid by the Secretary of the Interior. Two railroads, the Northern Pacific, St. Paul & Minnesota and Manitoba, will build to this region, and thousands of the settlers are ready to rush in as soon as it can be formally opened.

IDAHO.

SALE.—Wood River *Times*, June 9: The Wolf Tone mine on Deer creek, has changed hands. The transfer was accomplished yesterday, and the first payment made. The price agreed upon is $25,000—of which $0,000 was paid last evening, the remaining $19.000 to be paid within 30 days. The Wolf Tone was located by John Manniug, Thomas Finnegan and Patrick Leehan—the first-named having 300 ft, the second 450 ft, and the third 250 ft. The purchaser is J. F. Bailey, of the Philadelphia rolling mill's, one of the original stockholders in the Philadelphia company, of Ketchum. Bailey has taken out of that company, having become dissatisfied with Col. Green's management, and he proposes to operate for himself in his own behalf, and that of a few moneyed friends of his in Philadelphia.

WOOD RIVER HAPPENINGS.—*Times*, June 7: The most notable event of the past week in this region was the starting up of a concentrating jig at the Jay Gould mine, in Bullion. Being only intended as an experimental machine, run by hand power, it was erected as cheaply and on as small a scale as possible. Its utmost capacity is, therefore, about two tons of first-class ore per day. This quantity of ore is obtained by running through the jig rock which has heretofore been thrown on the waste dump. As the concentrated ore is of as good, if not better, grade than the first-class ore extracted from the mine, it follows that it must be worth at least $150 per ton. The saving effected by this small jig and the labor of a couple of men, therefore, amounts to over $300 per day. This sum of money will more than pay all the expenses of running the mine.

THE PHILADELPHIA SMELTER.—*Miner*, June 3: The smelter belonging to the Philadelphia M. and S. Co. is ready to begin operations as soon as a sufficient amount of fluxing can be obtained to insure a continuous run. Fine coal kilns, with 1,000 bushels capacity each, have been burning wood upon the ground for the past 4 weeks. It takes from 4 to 5 days to burn a kiln, consequently about 1,000 bushels are turned out daily. Mr. Bohler has the contract for burning 60,000 bushels, and is building 6 new kilns of brick and stone. Over 300 tons of high-grade ore, taken from the Elkhorn mine during the past winter, have been delivered at the smelter and assorted.

ORE BUYING.—The next important occurrence was the resumption of ore buying by the smelter at Ketchum. In one day last week the superintendent issued checks for over $30,000, in payment of ore which has just been sampled. The disbursements at the same works, in payment of ore, will probably average $2,500 per day from this time until the close of the open season. The arrival of C. W. Cortright, Captain Owen, and a number of other prominent mining and millmen operating in Sawtooth, and their evident determination to immediately open the grade across the Sawtooth range, notwithstanding the depth of snow covering it, was another of the notable events of the past week. Men are already at work shoveling the snow off the grade, and within a very few days teams can reach Sawtooth and Vienna without difficulty. The strike in the Silver Fortune up the East Fork, and of the Robertson brothers, on Deer creek, and the sale of the Wolf Tone mine to a Philadelphia capitalist, deserves rank among the notable events of the past week through out the Wood River region.

MONTANA.

HIGH-GRADE ORE.—*Inter-Mountain*, June 9: The Late Acquisition, it will be remembered, was closed down last fall and was idle all winter, as cold weather came on too soon for the building of a shaft house and the placing of the machinery. Within the past week operations have been resumed and important developments have already been made. About 125 ft east of the shaft an air shaft, which was started last year and which is 85 ft deep, shows 5 ft of very fine ore, assaying well in both gold and silver. Sinking is steadily progressing. Seventy ft south of the main shaft Menary was rambling around a few days ago with a pick in his hand and stumbled upon a ledge which had never been known to exist. The surface rock assays very high, and, as the croppings could be traced for several hundred ft, it was decided to sink a shaft and prospect the new find. For the past few days sinking has been progressing, and a fine-looking vein is being developed. To-day Menary took a sample across the ledge, which returned, according to Davis & Bennet's assay, 191 ounces in silver and 7 ounces in gold. The ore body from which this sample was taken is 20 inches wide, and if it will hold out, even to water level, Menary will realize a handsome little stake from the new discovery.

OREGON.

GOOD CLEAN-UP.—*Sentinel*, June 10: Alex. Watta informs us that he has just made the best clean-up at his mines near Williamsburg that he has made for a number of years past. He has also got his mines in a much better shape than ever before, promising good returns in years to come.

MORRIS JOY, the miner who fell down the Mendha shaft and paralyzed his lower limbs, and was taken to Salt Lake for treatment, writes that there is no hope for his recovery.

The Mineral Springs of California.*

Locations Descriptions, Analyees and Virtues.

Various classifications of miusral waters have heen made. The simplest is ths hest for preseut purposes. Thsy are all based upon the predominancs of some one or more principal iugrsdients. Hence we havs the alkaliue waters, the distinguishiug constituents heiug carhonates or bicarhonates of soda, potassa, lime, magnesia, etc., and containiug considerable carbonic acid gas; the saliues, most of them heiug apsrieut with the chlorides of sodium and magnesium, sulphates of soda, potassa and maguesia, etc.; sulphurous waters, characterized by the presence of sulphursted hydrogen, in other respscts heiug alkalius or saliue, in accordance with the predominance of one or the other class of iugredients; and the chalybeate, containing a certain proportion of iron, in combiuatiou with euhstances belonging to one or another of the above classes. Thsu, again, ws have the thermal watere of differeut degrees of temperature, from 75° to 100°, or eveu 140°.

Waters of the alkaline class, kuowu also as carhonated or acidnlous waters, have beeu chiefly advised in certain affsctious of ths etomach aud inteatiues, catarrhal in character, in bronchial catarrh uncomplicated by cardiac dieease, in gout, for the relief of which they have attained celebrity, in chronic rheumatism, in functional disturhances and engorgement of the liver, in catarrh of the bladder, in diabetee mslitus and in dropsy. They aie advissd in the dyspepsia attended with excessive acidity of the secretions, "with eour or rancid eructations and regurgitations," and flatuleut distention of the ahdomeu. Pure alkaline waters are seldom purgative; but, heiug uenally associated with the salines, they may become so. They are often more properly alkalo-salines. They are commonly decidedly diuretic, and correct an acid condition of the uriuary secretion. Hence, probahly, their utility iu rheumatism. For the chronic forms of this disease they are used intsrually or in warm haths, and are of decided efficacy.

The saline waters are aperient, diuretic, and excitant to the liver aud ite secretions, and to other members of the glandular syatem. They are, as above remarked, commonly associatsd with one of the other classes, and hence their medicinal effect will be accordingly modified. Many of them are thermal. They are used hoth internally and for bathiug, aud have been found efficieut in various cutaneous diseases; in scrofula, aud in gout aud rheumatism. They have also hsen employed euccessfully in diahetss, and Bright'e disease; in calculous coucretions of the gall-duct, and in uterine eugorgements.

Both of the above classes of miueral springs are frequently associated with iron in greater or less proportion, and hence are called chalybeate waters, whenever the iron is in sufficieut quantity to become promiuent. Chalyhsate waters possess, in a high degree, the virtues of ths ferruginous preparations, beiug in a form acceptahls to the stomach, aud which is readily introduced into the blood, improving its quality aud effecting the gradual removal of those states of tbe system knowu as chlorosis aud anæmia. They are of great benefit in disturbance of ths functious of the uterus, characterized hy amenorrhœa, when accompauied with a debilitated condition of the system, and also in excessive meustruation. Probably the improved hygieuic couditions hy which the patient is surrounded add greatly to the salutary effect of these waters.

Sulphurous Waters.—The medicinal effects of these waters depend mainly upon the combination of sulphureted hydrogen with the ingredients already described as composing the saline, alkaline, and chalybeate waters. They are admitted, howevsr, hy all authorities, to exert a sedative action peculiar to themselves, more or less marked, accordiog to the qnantity of the sulphursted hydrogen they contain. To the same snhstance is dne, in part, their diuretic action. They have attained considerable reputation iu chronic skin diseases, and in scrofula. For their curative virtue in chronic rheumatism they have very justly gained a great notoriety, bnt in such cases their sfficacy seems to depend more upon their external uss, in warm baths, than upon their internal administratiou. In paralysis, without organic lesion, they are of ssrvice, while in the same diseass attended with cerebral or spiual apoplexy, they are regarded to be injurious. (Stills.) "In eugorgemsnt of the livsr, abdominal plethora, and hemorrboids, tbe saline-sulphur watsrs have loug been justly esteemed as trustworthy remedies." (Walton.) Accordiug to Dr. Thompson (Cycl. of Pract. Med.), they are injurious to those lahoriog nnder general plethora, or are affected with inflammatory fever. In lead-poisoning they constitute a very valuahle remedy, effectually eliminating the poison from the system. They are also strongly advised, used internally, and as haths, in cases of amenorrhœa or defective meustruation, and in chlorosis.

Hints on the Uee of the Watere.

From what has now been said—which is but a geueral outline of the history of mineral springs and their nses—it may readily be understood that they are complex ageuts, varying according to their combination and temperaturs, and uot to be ussd indiscrimiuately or igno·rantly. That thsy are capable of doing great good has been ahundantly dsmoustrated; that thsy may exert a power for svil, is uot less certaiu; and these opposite effacts may result, not alone from the diffsrent kiuds of water used, but also from the method of using it. For example, a salins or alkalo-saline watsr may bs purgative or diuretic, almoat at ths pleasurs of the person takiug it. Large drafts taken before breakfast will probahly produce an apsrient effect; emaller oues at intervals during the day will be dinretic.

As to the quantity to be taken during the day, it may he etated, as a geueral rule, to he two or three glasses before hrsakfast, and as many during the day. It is better to pause, or eveu walk for a few minutes betwesu each glass. Miueral waters should not be used withiu an hour of the time of meals. When visiting the Ætna Spring, the writer was informed by visitors that a full draft of the water, taken soou after meals, invariably caused vomiting.

Small does are often preferable to large oues. Except in the case of aperieut waters, designed to regulate the bowels, a principal effect sought to he obtained is that resulting from the alterative actiou of the water—a slow modification of the system, a gradual stimnlation of the organic processes—by which the eecretory organs are improved and glandular obstructions rsmoved. Thus, judiciously used, many of the watere may prove a valuable tonic, while taken with less caution the principal purposes of their administration may be thwarted. Ordiuarily, several weeke of treatment are required to fulfill the indications. Miueral waters taken with all due care occasionally disagree, or they are strangely inefficient, or even do harm in cases apparently suited to their use. Iu such iustances, competent medical advice is needed to correct the trouble, to regulate, iucrease, or diminish ths quantity takeu, or to chauge the time of taking it.

Baths.

The exterual uee of mineral watsr is often more efficieut in disease that its internal administratiou. It is atteuded, too, with greater risks. It may be cold, tepid, warm or hot. Certain general rules have been laid down regulating the use of baths. They are better employed on an empty stomach, as in the morniug before breakfast, or at hed time, or an hour before dinner. Wheu two baths are used daily, as ie ths oustom at many watering places, probahly the bsst times are before breakfast and an hour before dinner; or, when it is desirable to promote perspiratiou, in ths evening, the patient retiring to bed immediately. Cold baths should, as a general rule, not he of longer duration than five miuutes; warm haths, 15 miuutes; hot baths, five to fifteen minutes. "In some cases, especially when the bath is used for cutaneous diseases, the patieut may profitably remain in for a much longer period, even from half an hour to an hour. As a gensral rule, and especially for delicate persons, active exercise should he avoided while in the hath; and always, on comiug out, the bather should be well rubbsd over the whole body with a ccarse towel." (Moormau, "Mineral Springs of the United States and Canada.")

Hot baths are decidedly stimulating in their actiou, increasing the force of the circulation and exciting the heart. The author above quoted, justly regarded as high authority in the use or mineral haths, states that they are "potent and positive agents. Wheu applied to the humau body they aie uever negatives in their influsnces, hut will do either much good or much harm, accordiug to the judgment and skill with which they are employsd. * * * * They should never be prescribsd merely for the uame of a disease, however carefully its nomenclature has been selected. The precise existing state of the eystem, whatever may be the pathology of ths disease, ought always to hs carefully looked to hefore a course of hot bathing is directsd."

Hot haths should never bs used hy persone having organic disease of the heart, or are the snbjects of hemorrhage from the lungs, or of a plethoric condition, with tendency to cerebral congestiou, as indicated by vertigo or ewimming in the head. Warm baths are likewise contra-indicated in such cases in proportion to their temperature.

Cold hathiog, though cousidered tonic in its effect, should he avoided hy those much debilitated, and in whom reaction is feehle or elow in coming on.

Consumptives, sven in the early stage of disease, should keep away from these watering places. Many of them are well adapted by location and climate for pereons of this class, it is true, and so far may he resorted to; hnt there is no fact in medicine, or in the history of cousumption, more fully attested than that the treatment of that disease hy mineral waters, especially the saline and alkaline waters, and their combinations, is positively hurtful.

The followiug springs have heen hrought to the notice of the writer. Some of them have heen personally visited and examined, and of others every reasonable effort hae heen made to obtain an authentic history.

Alkeline Springs.

California Seltzer Water.—This spring is located in Mendocino county, in the Coast mountains. It has an agreeable alkaline taste, ia antacid, slightly diuretic, and, in large quantities, is laxative. An analysis in our possssion gives ths followiug result to each pint:

	Grains.
Free carbonic acid—abundance	
Bicarbonate of soda	6.65
Carbonate of lime	8.80
Carbonate of magnesia	5.65
Chloride of sodium	2.15
Carbonate of iron and siliceous acid—traces	
Total	23.33

The nams of ths anthor of the above analysis ie not in the possession of the writer.

Adame' Spriug.—It is located in the mountains of Lake couuty, about eight miles south of Clear lake. Each gallon of water contaius the followiug:

	Grains.
Carbonate of lime	28.714
Carbonate of magnesia	99.022
Carbonate of soda	57.038
Carbonate of iron	.517
Chloride of sodium	4.112
Silica	7.218
Organic matter	2.811
Salt of potash—traces	
Nitric acid—traces	
Total	199.430

Each gallon also containe 304 cubic inches of free carbonic acid gas. We have not been able to visit this epriug. It bae attained a high reputation for the relief of the disorders to which this class of waters is especially suited. It has afforded marked relief in rhenmatism, and is much esteemed by those who have used it for the correction of certain diseases of the stomach assooiated with deficient secretion of bile. It is also thought by many who have visited it to be nssful in chrouic metritis.

Allen Springs, Lake County.—Amoug the many springs with which Lake county abounds, these are regarded by those who know thsm best, as being among ths most valuable. Their location is in a cauyon near the head of Cache creek, about 45 miles from Williams, in Colusa county. As just stated, the location is near the head of Cache creek, a beautiful spot, shaded by live oaks. There are two principal mineral springs. The following qualitative analysis, by W. T. Wenzell, has been brought to my notice: Chloridee of sodium, magnesium and potassium; bicarbonates magnesium, sodium and calcium; sulphate of sodium; phosphate of iron; silica, carbonic acid. It is strongly ærated with carbonic acid; salte of sodium and magnesium predominate. The waters of Allen springs have acquired considerable reputation in hepatic affections, and especially in chronic reual diseases. Dropsy, associated with ths latter, has been greatly relieved, and in an extreme case, reported to the writer, cured by the use of the water.

Geyser Spa Spring.—This spriug is located in Sonoma county. The solid contents in ons quart of water are reportsd as follows:

	Grains.
Bicarbonate of soda	5.87
Bicarbonate of magnesia	2.45
Carbonate of iron	0.95
Carbonate of lime	1.14
Chloride of sodium	2.40
Sulphate of soda	0.85
Silica	0.45
Loss	0.08
Total	14.28

The water of this epring, like some other mineral waters, is bottled aud eold for ordinary use. It is esteemed by many as an antacid, and mild corrective of disordered digestion.

Now Almaden Vichy Water.—The spriug containing this water is located in Santa Clara county, near the Nsw Almaden miues, about 60 miles south of San Francisco. It has been much used in old rheumatic and gouty affections, and is of value in debilitating and chlorotic affections, and in some gastric disorders and diseases of the liver. It has been advised in renal affections and gont. Analysis gives tbie result to each quart (name of the chemist not known):

	Grains.
Carbonic acid	28.02
Bicarbonate of soda	50.03
Bicarbonate of lime	8.00
Oxide of iron	1.02
Sulphate of lime	10.05
Sulphate of magnesia	3.00
Chloride of sodium	8.04
Solid constituents, with traces of silica	108.16

Alkalo-Saline Springs.

Hot Borate Spriugs.—This remarkable epring is situated in Lake county, near the town of Lakeport, at an elevation of abont 1,500 ft. It is easily reached by the Napa Valley railroad to Calistoga, and thence 30 milee by stage.

The water of thie spring, as analyzed by Mr. Moore, is found to be of a remarkable character. Hie analysis is snbjoiued:

	Grains.
Chloride of potassium	Trace.
Chloride of sodium	84.62
Iodide of magnesium	.09
Bromide of magnesium	Trace.
Bicarbonate of soda	76 96
Bicarbonate of ammonia	107.76
Biborate of soda	103 29
Sulphate of lime	Trace.
Alumina	1.26
Carbonic acid, free	36 37
Silicic acid	8.23
Matters volatile at a red heat	65.77
Total, in one gallon	484.35

In this table the constituents are necessarily calculated as anhydrous salts. The hiborate of soda, however, contaiua about 47% of water when crystallized, and the 103.29 grains given above correspond to 195 35 of crystallized horax. The most extraordiuary feature in the above analysie is the large amount of ammoniacal salt shown to be present in this water; in this respect exceeding any natural spring water which has ever heen analyzed. The horate spring has heen used in nephritic and calculous diseasss, dependent on sxcess of lithic acid, and also in certain scaly cutaneous sruptions.

Bartlett Springs, Lake County.—Ths Bartlstt springs are among the most popular of any of the numerous resorts of Lake county, at least among the population of the central portion of the State. They ars located in the southsrn portion of the couuty, near the head of Cache cresk, and about 45 miles from the town of Williams, in Colusa couuty, from which place they ars reached hy stage. The situation ie upon a flat surrounded by hille; upon the southeast elope of one of these lie the spriugs. There are two principal springs—one yielding the "Bartlett" water proper, and the other said to contain soda and iron. No thorough or authentic analysis of either of these springs has been made, but a doubtful qualitative examination is said to have revealed arsenic among ingredients in the "Bartlett" water. It is pleasant to the taste, ie cathartic, and very decidedly diuretic; it ie also alterative; and the fact cannot be denied that it has heen shown by abundant testimony to be of very considerable efficacy in many cases of chrouic rheumatism, skin diseases, and hepatic and renal affections. It is much eeteemed in dropsy, in uterine catarrh, and in functional derangemente of that organ; in neuralgia and chrouic malarial affections.

Toleuae Spriug.—The water of this spring is to be classified as alkaline, or alkalo-salius, thongh no analysis has yet bsen made of it. The location ie about five miles north of Suisun, easily reached hy the liues of the Ceutral Pacific R. R. from Sacramento or San Francisco to Snisun, and thence private conveyauce. The place is eaid to bs resorted to by many invalids from that portion of the State, who, for the most part camp in the vicinity. Small cabins have heen erected for those who prefer an indoor life. The water is estsemed by many who have used it for its efficacy in chrouic dyspspeia, and in renal disease. It is charged with carbonic acid gas and hottled at the epring.

Chalyheate and Alkalo-Chalyheate Springe.

Pacific Congress Spring, or Saratoga Spriug.—This ie a saline watsr arising in the Coast range mountains, 10 or 12 milee southwest from Santa Clara. The locality is one of natural beauty, healthful, aud admirably suited as a resort for those seeking a pleasant retreat from the cares and excitemsnt of city life, whsre pure air and varied sceuery combiue to invigorate both body and miud. Excellent accommodatious have been provided, the grounds have been improved, shady walks laid out, bathhousee erected, the water being artificially warmed to any desired temperature, and everything is arranged to ensure the comfort and enjoyment of the visitors. It has become, of late years, one of the most fashionable watering places of California. Like the watsr of the Napa and Litton springs, this too is bottled upon the premisee, and sold in the cities of the State. It is highly prizsd by many for its agreeable taste and antacid propertiss. Iu acidity of the stomach, in indigestion, in casse of faulty and depraved secretione from the liver, its use has become familiar to many who recsive it at their own homss. The large amount of iron it containe would almost entitle it to hs ranked as a chalybeate water, and rsudere it of essential service in chlorosis, anæmia, and wherever iron in combination with saliuss is indicated. Used freely at the springs before breakfast, thie wator acts as a purgative. It has a decided diuretic actiou when taken during the day in non-laxative doses. Analysis yields the followiug result in each gallon of water:

	Grains.
Chloride of sodium	119.159
Sulphate of soda	12.140
Carbonate of soda	123 351
Carbonate of iron	14.030
Carbonate of lime	17.295
Silica, alumina, and traces of magnesia	49.882
Total	335.857

Temperature, 50° Fabrenbeit.

The above analysis was made, I believe, by Bauer.

Napa Soda Springs.—Probably no mineral water in California is so well known, or has maintained its reputation among the community to the same extent, ae has that wbich goee under the name of Napa soda. It is sold and used as a beverage in almost every city and town in the State, and is esteemed as a pleasant, exhilsrating drink during the summsr monthe. The spriug is located on the western slope of the mountains east of Napa Valley, and ouly seven or eight miles from Napa City, and has from an early day been a favorite resort of the invalid. Its mineral combinations are such as to make it valuahls as a touic in anæmic conditions of the system, and in chronic dyspepsia where there is a predomiuance of acidity. It has been fonud to he an efficient aid to digestion, and a useful tonic, yet gentle aperient, when taken in the morning before eatiug by delicate females, and is rendered more efficient hy the addition of a grain of the sulphate of iron to a hottle of the water.

L. Lanzwnrt reported the followiug analysis, representing the constituents of one quart of water:

	Grains.
Bicarbonate of soda	3.28
Carbonate of magnesia	0.53
Carbonate of lime	2.72
Chloride of sodium	1 30
Subcorbonate of iron	1.96
Sulphate of soda	0.46
Siliceous acid	0.17
Alumina	0.15
Loss	0.62
Residuum from evaporation	17.19

*The account of the mineral springs of California is condensedfrom a review of the subject in the report of the State Board of Healtb for 1880, by F. W. Hatch, M. D., permanent Secretary of the Board. It is not complete, but is as comprehen-ive as was possible with the data attainable, and the publication of its leading parts in a popular medium will, we believe, be of public value.—EDS. PRESS.

Besides the value of this water medicinally, its location upon the mountain side of the beautiful and healthful valley from which its name is derived, gives it decided advantages over many other watering places in California.

Litton Seltzer Spring, Sonoma County.—This spring is pleasantly located near Healdsburg, Sonoma county, on the line of the San Francisco and North Pacific railroad, by which access from San Francisco is rendered easy. It is a carbonated alkaline water, clear, sparkling, and pleasant to the taste. The locality is much resorted to as a retreat from city life and cares, and on account of the medicinal properties of the water. The latter has been introduced into the market in bottles, and forms an agreeable beverage and antacid. It contains a larger proportion of iron than most other mineral springs in the State. The following analysis has been reported by Henry G. Hanks: Specific Gravity, 1.0038. When freshly drawn, the water is slightly acid. After standing, it becomes alkaline. One wine gallon of water contains of solid constituents 228.69 grains, in the following proportions: Carbonic acid (combined), 42.96; chlorine, 78.38; sulphuric acid, 2.36; silicic acid, 2 92, oxide of iron, 2.85; lime, 4 41; magnesia, 5 24; soda, 62.19; alumina, ammonia, potash, lithia, boracic acid, organic matter, 27.38; total, grains, 228.69.

Summit Soda Springs.—The location of these springs is near the summit of the Sierra Nevada mountains, 12 miles from the Central Pacific Railroad. The access is by that road, from Sacramento to Soda Springs station, thence by stage to the valley in which the water is found. The road to the springs is good, winding along the mountain side, so as to afford an easy descent to the valley below, the eye being continually greeted, during the route, by scenes equal in grandeur to almost any which the Sierras afford. The springs themselves are beautifully located in an expansion at the head of the deep canyon, along which winds one of the forks of the American river. The accommodations for visitors are excellent.

This might, according to the arrangement of some authorities, be called an "earthly-saline" water, although the large amount of carbonic acid it contains allies it to the *carbonated* waters. It should, therefore, if we can judge from its constituents and their known properties, possess, in a high degree, the remedial virtues which are supposed to pertain to these classes. Thus, the carbonic acid gives it a place in torpid digestion and certain dyspeptic troubles, while the association of its gaseous element with the alkalies and earths, with chloride of sodium and iron, makes it efficacious in diseases due to a scrofulous diathesis, in rachitis, in chronic affections of the mucous membranes, especially of the intestinal canal, in rheumatism, and in cases requiring its diuretic action. In fact, in some of these, more particularly in chronic catarrhal disorders and in rheumatism, it has been used with marked benefit. Probably, also, taken in connection with the climate of the locality, its elevation, its invigorating influence, it would prove effectual as a tonic and restorative in some nervous disorders, in anæmia and chlorosis, in atony of the mucous membranes, debility, and in convalescence from acute disease. Analysis yields the following results in a wine gallon:

	Grains.
Carbonic acid, 186 35 cubic inches	
Bicarbonate of lime	43.20
Carbonate of magnesia	4.20
Carbonate of soda	0.50
Chloride of sodium	26.22
Oxids of iron	1.75
Silica	2.06
Alumina	1.75
Potassa—trace	
Total	88.68

This water was analyzed by J. F. Rudolph.

Seigler Springs.—The value of these springs has long been recognized by the people in the central part of the State, and they have been much frequented by individuals. The location, near the head of a canyon, at an elevation, according to my informant, of more than 2,500 ft., is a pleasant one, and the scenery attractive. There are hot and cold springs—a soda spring, and a chalybeate spring. There is a hotel on the premises, and the surrounding grounds are suitable for camping. All the usual conveniences are provided for visitors—bath-houses and a spacious plunge bath. One of the springs is said to contain arsenic, and to have been found decidedly valuable as a remedial agent in chronic cutaneous diseases. An analysis is said to have been made of the Seigler springs for a private individual by whom they were purchased and extensively improved. I have not been able to obtain a copy.

Soda Springs, Shasta County.—So far as has been ascertained, no analysis has been made of these springs. The locality is of frequent resort, not so much on account of the medicinal value of the water, though this is held in high estimation, as for the advantages afforded in their vicinity for fishing and hunting. Prof. J. D. Whitney thus speaks of the springs in his Geological Report, Vol. 1: "There are two groups of mineral springs in this vicinity, one of which lies on the east side of the Sacramento, nearly opposite the mouth of Castle creek; the other is three and a half miles farther up and eight miles from Strawberry flat, at the base of Mount Shasta. The first lies called 'Lower Soda,' the other 'Soda Springs.' The latter are in the canyon of the Sacramento, at an elevation of 2,363 ft., and they are considerably resorted to, the water having a high reputation for its tonic effect, and being reported to have a specific action on the kidneys. The water is a chalybeate, there being an extensive ferruginous deposit around the spring. It is also highly impregnated with carbonic acid, sparkling like soda water, whence the name which is usually given in California to springs giving off carbonic acid, and not to those containing carbonate of soda. The temperature of the water was 52° in September, 1862."

Saline Sulphur Springs.

Tuscan Springs, Tehama County, California.—These springs have long been regarded by the residents of that portion of the State as possessing decided medicinal properties. They are located about nine miles from Red Bluff, on the Sacramento river, easily accessible from the latter by a good road. The locality itself is rough, rugged, and uninviting, being surrounded by evidences of volcanic convulsion, at an altitude of about 600 ft. A hotel on the premises affords plain but comfortable accommodations. There are three principal springs, two of which are used for drinking purposes. They belong to the class of "cold sulphur waters." Bath-houses have been erected, the water being heated by utilizing the carbureted hydrogen evolved. Experience has abundantly demonstrated the efficacy of the Tuscan waters in chronic rheumatism, cutaneous diseases of several forms, and constitutional syphilis. They are also said by Dr. Cameron, of Red Bluff, and other physicians, to be almost infallible in the cure of intermittent fever. They have a strongly saline taste, not unlike the Blue Lick water of Kentucky. They act, in most cases, efficiently upon the kidneys, and, with many, as an aperient. They are exceptional in their composition as containing iodine in considerable quantity. The temperature was determined at 78° to 80° for the "Red spring," 68° for the Black, and 66° to 70° for the White. A partial analysis of what is called the "Red water" gave the following results: Acid, sulphuric; acid, carbonic; acid, hydrochloric; iron, as bicarbonate; lime; potassa, as chloride; soda, as chlorids; magnesia; lithia; alumina; iodine. Quantitative analysis, roughly made, gave iodine to the extent of 0.06 grams per imperial gallon; nearly 25 grains of soda; one gram of lithia; a large amount of potassa.

Alkaline-Sulphur.

Witter Spring, Lake County.—This spring is situated in a deep canyon of the Coast Range mountains, three miles east of the Blue lakes, five miles from the town of Upper Lake, and 15 miles from Lakeport. The scenery is attractive, a fine view of Clear lake being afforded from the surrounding hills. The elevation is not known. There is a good public house, and a number of cottages or cabins for the use of visitors. There are several springs, the principal one, most relied upon by the afflicted, going under the emphatic name of the "Dead Shot," reference being had to its remarkable efficacy in chronic rheumatism, and in skin diseases, scrofulous and syphilitic. It is cold. In addition to the above there is one sulphur spring, which is artificially heated for bathing purposes, and one chalybeate spring.

Pearson Springs, Lake County.—The Pearson springs are located in an elevated valley, about 200 yards wide, between two high mountains. The situation affords superior accommodations for parties camping out. They are about one and a half miles distant from the Blue lakes, 14 miles from Lakeport and one mile west of Witter Spring. The elevation is not known, though it must be above 2,500 ft. On the hillside, east of the valley, are five springs; the most northern is known as the "Sulphur and Soda" spring; next on the south is the "Bartlett" spring, so called from its resemblance to the principal water at the springs of that name; next south is the "Soda" spring; next is the so-called "Gas" spring, this name being applied on account of the large amount of carbonic acid escaping; it is said to be strongly chalybeate; the character of the next spring, the last going south, is unknown. The gas spring is gently cathartic, and its continued use is said to be an excellent remedy in *habitual constipation;* it is also diuretic, and is supposed to exert a specific influence upon the liver, relieving cases of *jaundice.* It has a reputation as a tonic. The "sulphur and soda" spring is resorted to for the purposes to which that class of waters are usually applied, and has the asserted merit of curing obstinate *catarrhal* affections and *sick headache.* It is used more than any of the other waters here for bathing purposes, being artificially heated for the purpose. The "soda" spring is used as a beverage. All these springs are *cold.*

Thermal Springs.

Paso Robles Springs.—These springs belong to the "thermal sulphurous" class. They are so named from their locality being in a *pass of oaks.* The location is in San Luis Obispo county, access being by stage from the city of San Luis Obispo—a half day's ride—or, by the same mode of conveyance, from Soledad. Probably few of the mineral springs of California have acquired a greater or more favorable reputation than these. There are several springs, varying in temperature from 110° to 140° Fah. The water is used for drinking purposes, as well as bathing, and swimming baths have been prepared for both sexes.

The analyses given below show these springs to be particularly rich in bicarbonate of soda and chloride of sodium. They are actively diuretic and diphoretic, and, when liberally used, laxative. They are particularly distinguished for their curative properties in constitutional syphilitic disease, in chronic rheumatism, and in intractable malarial affections.

A number of instances have come under the observation of the writer, in which great benefit has resulted from a course of treatment at Paso Robles in syphilitic neuralgia, and obstinate cutaneous diseases arising from the same constitutional cause. Analysis in imperial gallon:

	Grains.
Free carbonic acid	19.50
Sulphate of lime	3.21
Sulphate of potassa	0.88
Sulphate of soda	7.85
Peroxide of iron	0.30
Alumina	0.23
Silica	0.44
Bicarb. magnesia	0.92
Bicarb. soda	50.74
Chloride of sodium	27.18
Iodides and bromides—traces	
Organic matter	1.64
Solid contents	93.44

In addition to the drinking water and baths at Paso Robles, there are what are known as the mud or "moor" baths, in which the patient is immersed for a certain length of time. They are stimulating to the skin and nervous system, promote the secretions, and have been thought to be particularly indicated in anæmia, chlorosis, old and obstinate rheumatic and syphilitic affections, in chronic hypertrophy of the liver and of the uterus; also, in old indolent skin diseases. The analysis of the mud or "moor" bath of Paso Robles makes its constituents as follows:

	Grains.
Sulphate of lime	17.90
Sulphate of potassa—traces	
Sulphate of soda	41.11
Carbonate of soda	5.21
Carbonate of magnesia	3.10
Chloride of sodium	96.48
Silica	1.11
Organic matter	3.47
Total	168.38

It contains, also, of carbonic acid, 47 84 cubic inches, and of alumina and the protoxide of iron, traces.

Alum Rock Spring, Santa Clara County.—This spring, or rather the several springs to be found here, is located about seven miles from San Jose, in what is known as the Penitentiary canyon, a romantic passage on the western slope of the Coast Range mountains. The locality is a pleasant one, the surroundings wild and romantic, and in the streams near by facilities are afforded for trout fishing; while the hills everywhere abound in quail and other game. There were noted four springs: the first, nearest the house, used mainly for bathing purposes, and running into the bath houses, temperature, 85°; second, what is called the drinking water; third, the sweet sulphur; fourth, also sulphurous, but weaker than the last mentioned in sulphur and acidulous salines. It is not known that any complete analysis has been made of those springs. They are considered beneficial in anæminic and atomic conditions of the system, in chlorosis, in chronic malarial cachexia, and in debilitated states generally.

Ætna Springs, Napa County.—These springs lie at or near the upper end of Pope valley, at an altitude of 1,000 ft. They are easy of access from the town of St. Helena, from which they are 16 miles distant, by an excellent, graded road over Howell mountain. The location is a pleasant one, the surroundings wild and picturesque, and the atmosphere dry and sufficiently equable. Cottages have been erected for the comfort of visitors, while the grounds afford ample facilities for camping. There are two principal springs, seemingly nearly identical in composition. The temperature is 98° Fahr., and the water is used mainly for drinking purposes. Another, with a temperature of 106° Fahr., supplies the bath-house. The two first-mentioned springs are clear and sparkling, carbonic acid gas being seen to be continually bubbling at the surface. There are also springs called "soda" springs, said to contain iron.

The Ætna springs, though open to the public for only a few years, have already attained considerable reputation, and appear to be rapidly gaining the confidence of certain classes of invalids. Testimonials—perhaps a better test of the value of a mineral water than the most elaborate analysis—from intelligent persons, some of them medical men, have been given, of relief afforded by the use of the water in renal affections, rheumatism, neuralgia, hepatic engorgement, and other similar diseases. They have been compared, not inaptly, in composition and effects, to the Eme water of Europe. The following comparative analysis has been published:

Contents in a Gallon.	Ems. Frescnius.	Ætna. Bauer.
Carbonate of soda, grains	84	75
Carbonate of magnesia, grains	7	14
Carbonate of lime, grains	10	10
Carbonate of iron, grains	trace	
Sulphate of soda, grains	trace	8
Sulphate of potash, grains	2	
Chloride of sodium, grains	62	23
Silica, grains	3	trace
Total solids, grains	170	137
Carbonic acid, cubic inches	59	58
Temperature, degrees Fahrenheit	115	98

Skaggs' Hot Springs, Sonoma County.—These springs are located in the Coast Range mountains, 14 miles northwest of Healdsburg, and 8 miles west of Geyserville. The springs and chalybeate well are on the verge of a small "flat," caused by the convergence of the sloping bases of several hills. A hotel has been provided, neat in appearance and well kept, and a number of small cottages for families or invalids, and the excellent accommodations, together with the pure air, the scenery and medicinal properties of the water, render the place attractive. There are two springs of hot water, a small cold soda spring, and a chalybeate well. The principal spring—that most used for drinking and bathing purposes—is situated in the bed of Dry creek, a tributary of the Russian river. It has a temperature of from 130° to 140° Fahrenheit, is clear, sparkling, pungent to the taste, from the large amount of free carbonic acid it contains. This water has been much recommended for rheumatism, sciatica, neuralgia, some forms of indigestion and in chronic diseases of the kidneys. It is believed by the writer to be one of the best springs of which an analysis has yet been obtained, in the indigestion induced by the too free indulgence in alcoholic stimulants, and for the kidney difficulties which complicate such cases. The following analysis was made by Prof. E. W. Hilgard, of the State University; another, made by the writer, giving substantially similar results, is omitted:

	In 10,000 Parts.	Grains per Gal.
Chloride of potassium	0.035	0 200
Sulphate of potassium	0.043	0.260
Chloride of sodium	1 012	5 900
Iodide of sodium	trace	trace
Bicarbonate of sodium	27.672	161.270
Biborate of sodium borax	4 542	26 470
Carbonate of lithium	0.010	0.060
Carbonate of barium	0.040	0 240
Carbonate of strontium	0.004	0.024
Carbonate of calcium	0.377	2.197
Carbonate of magnesium	0.191	11.113
Carbonate of iron	0 009	0 054
Alumina	0.004	0 004
Silica	1.205	7.023
Total solid ingredients	35.144	205.215

White Sulphur Springs, St. Helena.—These springs are located in Napa valley, about two miles from St. Helena. The grounds have been beautifully laid out and ornamented with shrubbery and evergreens, neat cottages have been erected for visitors, and the entire place with its surroundings, is one of the most pleasant of our summer retreats. There are nine springs, possessing substantially the same medicinal properties, varying only in temperature and in the relative proportion of their solid constituents. Of three of these a quantitative analysis has been made by Prof. LeCompte, the result being the following, in a wine gallon.

	No. 2.	No. 6.	No. 7.
Temperature of spring, August, 187	89.6 F.	86.0 F.	69.8 F.
Specific gravity	1.00026	1.00040	1.00038
Solids.	Grains.		
Carbonate of lime	1.25	2.44	5.56
Carbonate of magnesia	0 62	0.56	4 36
Sulphate of soda	8.26	11.23	12 84
Chloride of sodium	21.72	24.41	14 23
Chloride of calcium	1.32	0.86	0.78
Chloride of magnesium	0.87	2.22	0 05
Sulphides sodium and calcium	2 05	1.85	1.02
Total	36.09	42.67	40.04
Gases.	Cubic Inches.		
Sulphureted hydrogen	5.15	4.25	trace

The other springs, of which only a quantitative analysis has been made, possess the same ingredients. The waters are used both internally and for bathing.

These springs belong properly to what are called the "light sulphur" waters. Taking into consideration their temperature, more especially that of Number One, which is used principally for bathing purposes, and which is thought to contain a greater portion of sulphureted hydrogen than the others, we can image them useful for the general purposes to which this class of waters are adapted. At the present time, and under present management, the place is kept rather as a pleasant, healthful and fashionable resort for the wealthy citizens of the metropolis and other cities than as a sanitary retreat. For the former it is delightfully adapted; for the latter it might be profitably employed.

Calistoga Springs.—Nine miles from St. Helena, at the present terminus of the Napa railroad, lies the pleasant locality of Calistoga, 500 ft. above the sea. There are five or six principal springs. They are sulphurous and thermal—the temperature of one which was tested being 97°. The waters are employed both for drinking and bathing, and suitable conveniences for the latter have been prepared. They appear to be similar to those of St. Helena, yet probably lighter, containing less of the sulphureted hydrogen and of the metallic sulphides. They have been used with advantage in the diseases to which this class of waters are suited, especially in rheumatic affections. Like the springs at St. Helena, there is the additional advantage of a good hotel. Analysis yields the following result in each gallon of water:

	Grains.
Sulphureted hydrogen gas—3.271 cubic inches	
Chloride of sodium	32.250
Chloride of calcium	3.263
Carbonate of soda	3.406
Sulph. soda	1.616
Sulph. magnesia	0.466
Silica	6.500
Alumina—trace	
Total	37 501

The above analysis was made by J. F. Rudolph, of Sacramento.

Harbin Springs.—Twenty miles from Calistoga, in a wild and picturesque canyon of the Coast range of mountains, are what are known as the Harbin springs. Here too are numerous springs, possessing substantially the same medicinal and chemical properties. Like the others of which mention has been made, these are thermal, the principal spring having a temperature of 118° at its source. From this the water is led into bath houses, arranged in such a manner that baths can be obtained of any desirable temperature, either hot or tepid, according to the distance from the source of the supply. Connected with each bath are facilities for the application of steam. No accurate

(CONTINUED ON PAGE 396.)

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SAN FRANCISCO:

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Passing Events.

The event of the week is the decision, by Judge Temple, in the Gold Run suit, which involved the vexed debris question. The vital points are that the miners have no right to deposit material in the water courses; and that they must detain the bowlders, cobbles and heavier sands. The miners will, therefore, be compelled to build dams to hold back this material. The decision is quite voluminous, and we publish four pages extra, in addition to our eight-page supplement, in order to give space for it. Comments on the decision will be found in another column.

This week's MINING AND SCIENTIFIC PRESS contains a large amount of information of an interesting character, and we have been even compelled to defer to another number some matter which we intended giving.

THE *Herald's* Fort Keogh (M. T.) special says: Among the good results of Villard's visit to the West is an order that hereafter there shall be sold to no person more than 160 acres of the Northern Pacific lands. For months past the West, and especially the Yellowstone valley, has been swarming with Eastern speculators buying up large tracts of land to be held for a rise. Villard's order completely checkmates these speculators.

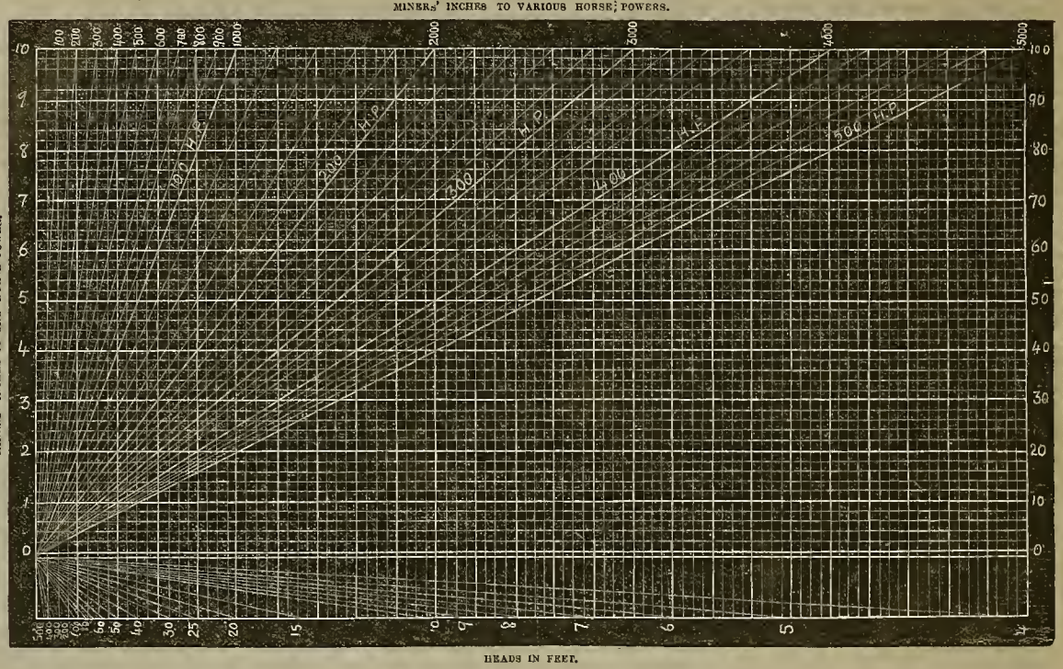
THE Central Arizona Co. (Vulture mine) produced $19,135 during the month of April.

Miners' Inches for Various Horse Powers.

Since the measure of a large quantity of water is most apparent to the mind from a consideration of the size of the opening which is required for its passage at a certain fixed velocity, the miners' inch forms a good standard of measurement. Four miners' inches will permit the passage of sufficient water in one minute to give an effect, with a fall of 100 ft., of one-horse power, at a percentage of 80. The scale on the page here has been constructed upon this standard by the "Union Iron Works," to the proprietors of which we are indebted for the engraving and the following description:

The diagonal lines in the left-hand section represent heads of water from four feet to 500 ft. The column at the bottom shows the number of miners' inches to one-horse power for the various heads. To find how many inches are required for one-horse power at any head, the horizontal line occurring at the intersection of the line on the right with the margin, is followed to the diagonal marked 500 HP. The perpendicular line at this intersection is followed to the column of miners' inches, where the amount is indicated. Thus, with ten feet head, the horizontal line at the intersection with the margin is followed to the line marked 500 HP. Here a vertical line intersects, which, on being followed to the column of miners' inches, indicates 40 inches to one-horse power.

The remaining portion of the scale is simply a scale of multiplication. The diagonals represent horse powers from 10 to 500. The perpendicular lines represent miners' inches to one-horse power, and are numbered from one up to ten. By following the line of inches to the line of the horse power, and then taking the horizontal line to the margin at the right, the number of miners' inches for the horse power are found indicated in the margin. Thus, four inches followed to 300-horse power and then carried to the margin at the right, indicates 1,200 inches. The result may also be found by one operation. Suppose that there is required the number of miners' inches necessary to 200-horse power at a head of six feet. The horizontal line followed from the intersection of the six-feet line on the left margin, to the line 500 HP., gives the vertical line of 64; this line carried to the line of 200 HP., gives the horizontal line of 1,280; but, since the line of 64 has 10 times the value at the end from which we have worked that it has at the other end, the horizontal line will in this case have a value 10 times as great as the margin indicates. This will make the result 12,800 inches for 200-horse power at six feet head.



FIVE men arrived at Mullan tunnel, Montana, a few days ago. They said they were destitute and anxious to work. The superintendent gave each man an ax, with instructions to go into the timber and chop wood. Five days they came and went, looking each evening like men who had done an honest days' work. The sixth day arrived, but the five hewers of wood were missing. Failing to find them, the superintendent went into the timber to see how much wood had been chopped. His disappointment can be imagined when not even a chip was visible, but in a cosey nook five beds of the softest pine boughs were found.

THE Greenville *Bulletin* says good miners are in demand there. Plenty of men to work are there, but few of them understand mining.

THE railroad shops in Sacramento employ over 1,500 men, and in a short time this number will be increased to 2,000.

The Debris Decision.

The decision in the famous Gold Run suit, which we give in full in a supplement to this number of the MINING AND SCIENTIFIC PRESS, is a "setback" to the miners; but it is by no means as bad as it might be, or as bad as a mere casual reading would lead one to infer. An analysis of the decision is much more encouraging to the miners than appears at a glance.

The immediate effect will be to depreciate the value of gravel deposits temporarily, and to temporarily depress the mining interests of the State. It will bring down the value of the bonds of the mining companies, depreciate their stocks, and cause them more or less embarrassment, in one way or another.

The case will be appealed, of course. A new trial will be applied for, which will be denied, and the case will then go to the Supreme Court of California. There are several technical points to be made in the appeal, among them the question of the competence of the Attorney-General to bring the action.

The decision gives the miners the right to continue mining, *provided* they impound or detain the bowlders, cobbles and heavy sand, which can easily be done. As a matter of fact, in the Gold Run mine, none of this sort of material came down at all. The judge says himself it will take 12 to 20 years for the material to reach navigable waters. The miners can soil the waters with lighter mud if they so choose, and they cannot be prevented from doing this.

The general conclusions of the decision are perhaps correct. The miners will accept the decision as rendered with fairness by an able judge. The trial lasted many weery days, and an immense mess of contradictory testimony was presented. Experts on both sides testified voluminously. All this the judge had to thoroughly digest, separate the "wheat from the chaff," and there is no doubt, from reading the decision, that the gentleman has given the whole subject close study, careful attention and impartial judgment. Partisan feelings may bring other conclusions, but a careful reading of the decision will convince most persons that, whether right or wrong in the abstract, the conclusions are evolved from arguments duly weighed and considered

Nine out of ten of the mines are prepared to control their heavy gravel, rocks and sand. In fact, nearly all can do it, and will construct such dams as will keep back the heavy material. They will comply with the decision the more cheerfully, knowing that the expenses for so doing will not exceed those of litigation.

The main point of the decision, as we understand it, is this: The miners claimed a prescriptive right to dump the tailings into the stream. The effect of the decision is, that no such rights ever existed or were acquired. The miners thought they had this right, and exercised it in good faith. Judge Temple now decides that they had not; but, at the same time, he says they can carry on their industry, provided they restrain the heavy material.

Temporarily, capital will be withdrawn from the hydraulic mining industry, until the whole question is settled.

We venture to predict, however, that this will not affect the gold product of California for more than one year. During that time such dams will be constructed as will comply with the conditions of the judgment.

The judge has tried the whole case on the *known* damage on Bear and Yuba rivers; and he admits that, as far as the Gold Run mine is concerned, he is "unable to say that this mine, without reference to the debris from other mines, materially contributes to the evils mentioned; or, in other words, if there were no mining operations save those of the defendant, I am not prepared to say that it would materially injure the valley lands or the navigation of the river. It is the aggregate of debris from all the mines which produces the injuries mentioned in these findings."

This paragraph shows that if the miners had confined their defense to that particular mine, the suit would probably not have been lost. But the miners have been liberal in this matter and have met the issues broadly and fairly.

There is a sort of panic just at the moment among hydraulic miners, of course, but second thought will convince the most despondent that if the decision says they must impound the heavier material, it also gives them the right to let the lighter material pass on. It is not the heavy material of which the farmers complain so badly. If the miners contended that they had vested rights to dump tailings into the water courses, and the judgment is that they have not, the same judgment says they can soil and muddy the waters if they choose.

There are now some 32 of the larger hydraulic mines under injunction, but they are all working. Dams will be built, jointly or separately, and it is not probable the mines will shut down. By taking the proper means, the industry is allowed to proceed, and the radical measures prompted by those who contend that the whole business shall be stopped, are, of course, to be thrown aside, and have received judicial rebuke.

The decision is, in effect, a judicial enunciation of the doctrine that the miners cannot empty their sand into the streams. The miners contended they had vested and prescriptive rights to do this. Judge Temple says they have not. The decision not only settles the question as far as this court can settle it, but also does something unusual for a judicial document, viz., suggests the remedy for the evils complained of.

THE CHARGES AGAINST COL. MENDELL.—The Executive Committee of the recently formed Anti-Debris Association met at Sacramento last week, and evolved some very curious resolutions. The principal business, however, appeared to be to adopt a memorial to the Secretary of War, asking the dismissal of Col. Mendell, of the U. S. Engineers, mainly on the ground of his having been accessory to fraudulent surveys of the bay of San Francisco. Of course, such a charge, to those who know the gentleman whose integrity is assailed, is simply absurd. The Miners' Association had, some time since, a trip on the bay, to ascertain the character of the deposits, and samples of the bottom were taken. Mr. Randall, Mr. Skidmore and Mr. Smith, all officers of the association, took the samples. A number of newspaper men and engineers were invited guests, among them Col. Mendell. There was no survey made at all. The trip took one day only. As the samples of deposits were never submitted in court, and Col. Mendell was not called as a witness in the case, it is hard to see what he had to do with it. The gentleman was instructed by the War Department to make a report on the navigable rivers and the debris, which he has done in an impartial and intelligent manner. Because his conclusions do not agree with those of men who have a superficial and biased knowledge, his removal is asked. It is not probable the matter will be heard of again, as Col. Mendell stands high as an officer and a gentleman, and a man of sterling worth, integrity and conscientiousness.

Shaft Sinking.

An Interesting Account of a Difficult Job.

In the Columbia School of Mines *Quarterly* appears an extract from a memoir of Messrs. Vondy and Emrich (by R. H. Vondy), giving an account of shaft sinking under difficulties. It is stated that, had these difficulties been anticipated from the start, no doubt some other plan of work could have been adopted. The shaft referred to is shaft "B," Barnum mine, Ishpeming, Mich.

In the month of June, 1879, a diamond-drill hole was bored 750 ft. west of the present location of shaft "A," and 75 ft. north of the location of shaft "B." A thick bed of iron ore was reached at a depth of 266 ft., which, it was thought, could be worked profitably.

Having succeeded in sinking shaft A to a good depth, it was decided to sink another, for two reasons: first, that it would be more economical to work with two shafts than with one; and, second, that in case of any accident in the mine, or in one of the shafts, the miners would have the other to escape by.

The quartzite and the ore-deposits are here covered by a bed of sand, 102 ft. thick. The first bed, which is of lean ore, is 170 ft. 8 inches below the surface of the quartzite and is 3 ft. 6 inches thick. The next bed, which is good ore, is at a depth of 242 ft. 4 inches, and is only 8 inches thick, under which lies a bed of ore mixed with chlorite, which is 26 ft. 10 inches thick, and under this again (261 ft. 1 inch below the ledge) lies the bed of good ore, which is 26 ft. 5 inches thick.

On January 26th, 1880, the company commenced the sinking. The ground was leveled off, and cedar logs, 40 ft. long and 9 inches in diameter, were laid in two horizontal layers (the logs in one layer lying across those in the other) in such a manner as to leave a space in the center about 14 ft. square; then 4 large pine timbers, 16 inches square and 40 ft. long were laid across these, the second two lying at right angles with the first two, leaving a clear space in the center 12 ft. square.

The 40 ft. square of cedar logs was intended as a foundation for the shaft-house and also to support the large cross-timbers from which the timbering of the shaft was suspended.

The shaft house is 19 ft. 6 inches square at the base, 12 ft. square at the top, and 22 ft. high. It consists mostly of 12-inch by 12-inch timbers.

The sinking was commenced by driving 3 inch planks down into the sand, outside of the 16 inch timbers, and shovelling the sand from the inside space as the boards went down until a depth of 5 ft. was reached, when the first set of timbers was put in place. These were 14 inches square and 14 ft. 4 inches long, and when put together left a space 12 ft. square inside. The timbers were held in position by 16 iron bolts 1¼ inch in diameter and 6 ft. 6 inches long, 4 to each timber. They went through holes in the large foundation timbers and through holes in the first set below, when the washers and nuts were put on and the timbers drawn up until they were squeezed firmly against 4 pine blocks, 14 inches square and 4 ft. long, set on end, one at each corner. This set being firmly placed, the sinking was continued until a depth was reached at which another set of timbers had to be put in, this set being suspended from the set above in exactly the same manner as before.

This continued until the first set of sheeting-boards had reached its depth, when the boards had to be driven from the inside and the regular fore-poling system was adopted. The poling-boards were made of hard wood and were about 7 ft. long, 2 inches thick, and 8 inches wide, sharpened at the entering end. There was a set of round timbers, 9 inches in diameter, put in midway between every two sets of square, to give the poling-boards the necessary support and also to guide them; but, as they were not needed after the poling-boards had left them, they were taken out and used over again below. When the wedges between the lower ends of the poling-boards and the timbers were taken out, and a new set of boards started, there still remained a 3-inch by 6-inch plank between the boards to keep them apart. See Fig. 3 of plate.

This system worked very well, and by the end of February about 31 ft. of sand had been taken out, but after sinking a little deeper, quicksand was met with, and with great difficulty the shaft was sunk about 10 ft. lower, when the water and sand rushed in from below, and filled up the bottom of the shaft so quickly that the men just escaped with their lives.

When the water and sand rushed in at the bottom, the whole structure, shaft-house and all, commenced to sink with a terrible groaning and cracking noise, and it did not stop until it had sunk about 5 ft. or more.

After a short time the damages were repaired, the pumps started, and the shaft was soon free from water; then the workmen went down and began to take out the sand that came in, but when they got down to about the same distance from the bottom as they were before, the sand and water came in again with the same result, the workmen having a narrow escape, and the structure sinking about the same distance as before.

Before work could be resumed the shaft-house had to be raised some, and timbers 12 inches square crossed under it; then the operation already described was repeated, with exactly the same results as before.

A thorough examination of the timbering was then made, and it was found to be very much strained and twisted, and it was then decided to change the system of sinking.

The next plan adopted was to sink an iron caisson by weighting it and then pumping the water out and allowing it to rush in again, thus making room for it to drop down by the displacement of the sand. The larger part (48 ft. in length) of the caisson was made during the month of August. It is 10 ft. 6 inches in diameter inside, and consists of sections or rings four feet high, each section being made in three parts. The sheet iron of which it is made is one-half of an inch thick, and each part has a three-inch flange all around its edge, so that it can be fastened securely to the parts on each side of it, and to the sections above and below. The flanges are braced by angle irons three-sixteenths of an inch thick, and the parts forming the sections and the sections themselves, are bolted together by ¾-inch bolts, four inches apart between the centers. To keep it from leaking, pieces of ⅜-inch hemp rope, well tarred, were placed between the flanges before fastening them. A steel section, one foot high and in three parts, was fastened on the bottom by rivets. Its edge is quite sharp, and it projects about six inches below the sheet iron.

When a number of sections of the caisson were ready, they were put together, one by one, directly over the shaft, and as the work proceeded the caisson was lowered, and when it stood on the bottom there was about two feet of the sixth section above the water; the remaining sections were then put on, making 12 in all, and the timbering commenced on the inside, beginning at the bottom and proceeding upward, the bottom timbers resting on the lower flange of the seventh section, which is 24 ft. from the bottom of the caisson.

The timbering was so arranged as to leave a clear shaft with a cross-section of nearly five feet by nine feet, and the spaces left on each side of this were closed in with thick plank and ailla placed across, every eight feet. These cells were filled, as the timbering proceeded, with old iron, poor ore and any heavy substance that could be found, care being taken to keep the weights on each side as nearly equal as possible.

The ladders were fastened vertically against the timbers at one side of the shaft, and a pump was placed in the shaft in a small space left for it in one of the cells, a little above the level of the water, and the discharge-pipe arranged so as to empty the water into a launder, which carries it off to the swamp.

When everything was ready the pump was started and the water all pumped out, and a number of men set to work to send up the sand, which they continued to do until they nearly reached the bottom of the caisson, at which point the sand and water rushed in, the caisson sinking as the sand was carried from under it, until it had settled about 10 ft. The workmen, always being on the watch for this occurrence, escaped without much danger.

The pump was again started, the shaft pumped dry, and the excavation resumed; but the sand became more treacherous and the men had more difficulty working with it. Consequently, the results were not nearly so good, and the work progressed very slowly. It was, nevertheless, continued until a depth of 58 ft. was reached when, after a hard and long struggle, a further drop of two feet was accomplished.

It was now discovered that the valves of the pumps were completely worn out by the action of the sand passing through them, and before proceeding a new pump had to be procured, which was ordered to be made very large and so constructed that it could pump sand mixed with water without injury to the valves. As the pump had to be made it caused a great delay, but as the men were needed to repair damages done to shaft *A* by a fire, they were kept at work in the meantime.

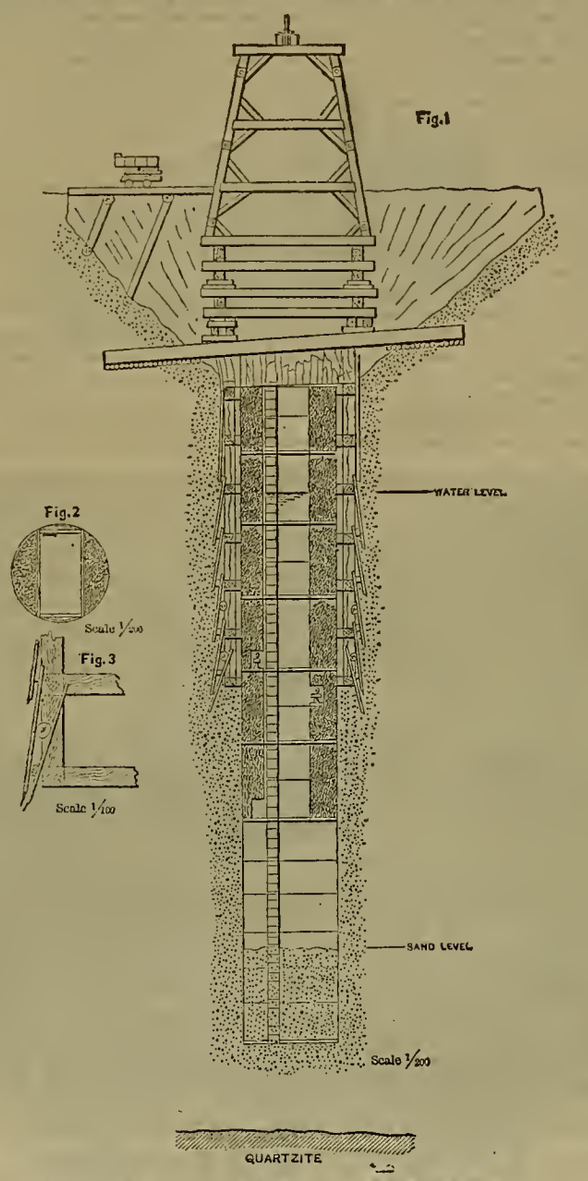
As the caisson stands now, it is 71 ft. long, new sections having been put on at different times. The last or top one is made of ¼-inch plate, and is only three feet high, but it will have more than one foot of its length out of the water when the caisson rests on the ledge. The timbering has been carried up to the top and all the cells loaded. The total weight of the ballast is about 75 or 80 tons.

The top of the caisson is 21 ft. below the grass level, and the bottom is only 10 ft. from the ledge, but the sand is about 10 ft. deep in the bottom of the caisson, and the water is within 11 ft. 6 inches of the top.

There are two pumps still in the caisson; one is a No. 5 Cameron, which is 18 ft., and the other is a No. 8 Knowles, which is 22 ft., below the surface of the water. The supply pipe, which is two inches in diameter, is not large enough, and will have to be replaced by a larger one; but the discharge pipes, four inches in diameter, and the exhaust pipes, two and one-half inches in diameter, are all in good order and can be used again.

The large foundation timbers have sunk down about 18 ft. in the sand, and having sunk faster on one side than on the other, have consequently broken the iron rods on one side which held the timbers together, and made it necessary to block up the shaft-house so as to get it plumb again.

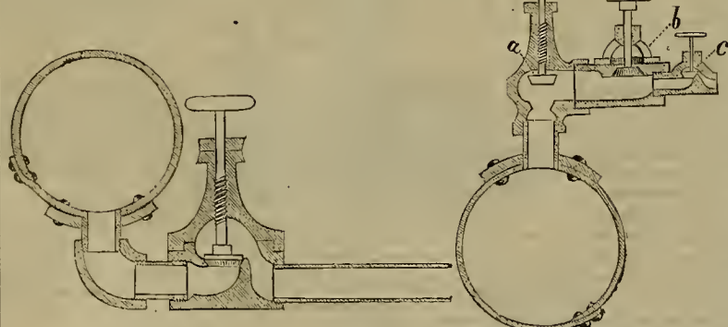
Arrangements had been completed for the repair of these damages, and to have things ready to resume work when the new pump came. This was expected about the first part of August.



SECTION SHOWING METHOD OF SHAFT SINKING.

Blow-Offs and Air Valves in Hydraulic Pipes.

We give herewith engravings showing the method of regulating the air in pipes in use by the Virginia and Gold Hill water works. At their water works the body of water passed through an inverted syphon over seven miles long on very irregular ground, in doing which the enormous pressure of 1,720 ft. has to be overcome. This pipe now contains the greatest pressure of any in the world. The average diameter is 11½ inches. At the point of heaviest pressure the iron is No. 0 thick, and is but riveted with five-eighths inch rivets. The pressure is 1,720 ft. perpendicular, or 750 lbs. to the square inch. This pipe crosses a great many sags and spurs, and devices had to be arranged to relieve the air. Fig. 3 shows the blow-off used in every low place, and Fig. 4 shows the self-acting air valve. The latter is used at each high point on the line of pipe. When the water is on the valve, *a*, is kept wide open; the small valve, *c*, is shut while the valve, *b*, is shut by the pressure. If any air accumulates in the pipe, on the elevation where the air cock is placed, it is occasionally blown off by opening the cock, *c*. Should a break occur in the main pipe line at a point lower than the air cock, and within its district, the valve, *b*, falls down and admits the air into the main pipe so as to prevent a vacuum. Should the valve, *b*, get out of order, the valve, *a*, is shut and the other valve, *b*, taken off and repaired. After a break on the main line is repaired, and the water let on again, the valve, *b*, being, down or open, the air rushes out at *b*, its stem being weighted by the weight, *d*, so as only to close when the solid water commences to rush out.



BLOW-OFF USED IN LOW PLACES. SELF-ACTING AIR VALVE.

When Como Comes Out.—The Carson *Appeal* says: "The most sanguine miners in the State are those of Como. They frequently visit Carson, telling big stories of their expectations." No person ever saw an old Comoite that was not hopeful for the future of Como—always talking about "when Como comes out." But Como never comes out with the bullion.

The Mineral Park mill, Mohave county, is running in full blast, and turning out about $1,000 daily in silver bullion.

THE BALDWIN HOTEL, SAN FRANCISCO.

The Baldwin.

BY J. C. H.

San Francisco, the emporinm of the empire of the Pacific coast, is second to no city in the United States in msgnificent and well-appointed hotels. Standing at the head, without an eqnal in design, elegsnce and comfort, the "Baldwin," of this city, is what the Palmer house is to Chicsgo, and the Fiftb Avenne hotel is to New York. Mr. E. J. Baldwin, one of onr enterprising and public-spirited, active bnsiness men, by secnring the aid of the leading artists and builders of this conntry and Europe, has succeeded in erecting and fnrnishing, at a cost of $3,500,000, a hotel which is the pride of a great city and the resort of the cultnred and refined people of this State and the resting-place for the tonrist and traveler.

As onr engraving shows, this pslace of luxnry is bnilt in the French Rennaissance style of arohitectnre, having six stories, inclnding the Mansard, and so designed as to carry np each bay window projection a completeness in itself —the entire faces being banded and held in unity of design by belt corses, cornices and balustrades. These faces, or bays, form the entire facade of the building, and alternate in size according to the external and internal arrangements; the lsrge bays having side windows opening into the parlors of the various suites of rooms, while the smaller bays serve to light the front chambers. One of the striking features of the design as carried ont is, that the Mansard finish of the bays gives two or three different hights or elevations, according to the location, as affecting the symmetry of outline; and also varying in size and design in the same ratio as regards their hight.

The dome surmounting the angle of Market and Powell streets is hexagonsl in plan at the hase, and is carried up to the apex in the same general form; this contour being made to snit the angles formed by Market, Powell and Eddy streets, which form the three sides of a hexagon. The hight of this main dome above the pavement is 168 ft. It contains in itself five stories and a bull's-eye or lookout at the top.

The principsl dome on Powell street has an altitude of 120 ft., and is of the same general design as the one jnst described. It is, however, sqnare in plan.

The fonr extreme angles of the fronts are carried np into towers, baving two stories and forming ontposts, showing to great sdvantsge shie trnly immense architectnral display contained within them. No pen can do justice to the snbject. A carefnl and prolonged view mnst be had to obtain any idea of the extreme beanty and finish of the entire etructnre. Tbe lot occnpies the irregular-ehaped lot bonnded by Market, Powell and Ellis etreets, and has a frontage of 184 ft. on Msrket, 25 ft. on Eddy, 275 ft. on Powell and 138 ft. on Ellis etreet. Tbe basement of the building is entirely brick and iron. The outside walle have a thioknese of 3 ft. 2 inches, with footings 9 ft. wide. The interior walls and walls of the theater have a thickness of 3 ft. 2 inches, with footings 7 ft. wide. All the piers are ospped with granite slahs 10 inches thick, sub-basing the iron work of the firet etory. All cross and partition walls and interior supports are of briok laid in cement, and 10-inch cast-iron heavy colnmns, no woodwork whatever being nsed in basement. The sidewalk, vaults, boiler and engine-rooms, coal-bunks, etc., all conetruoted of iron beams and brick arches. The first story of building ie entirely iron, both the exterior and interior colnmns, the exterior front being donbled, having 12-inch heavy cast-iron columns, with 12 inch cast-iron sqnare pilasters. This frontage is capped and surmonnted with a row of heavy csst-iron lintels of the "Hodgkinson pattern," 26 inches high, 22 inches wide, and with an average thickness, of two-inch metal with donble heads, bolted together with wrought-iron holts; thus making the entire circnit of the building 622 ft. at the first story, one solid, heavy mssa of bolted metal, and of the best quality standard American Eastern iron, a qnslity which is not used in San Francisco only under direct and special specifications. This is the first outside msin brace or tie against the effect of earthqnakes. The wooden partitions in the first story between stores, sre dividing and not sustaining works, and are made of this material to contract or extend the size of stores, as occasion and the march of improvements may hereafter demand in this new quarter. The rear walls, cross walls, and walls of all permanent divisions, are of brick laid in cement, and are 2 ft. 2 inches, 21 inches and 13 inches thick, from the first story iron lintel course upward.

The entire outer walls and superstructure to roof and domes can be drenched with a stream of water, requiring the attention of no fireman or attendant from the stories below. Two artesisn wells, capable of snpplying 71,000 gallons daily, exist in the basement; this, with a reservoir, with a cspscity of 60,000 gallons, in the basement, and tanks on the roof holding 82,000 gallons, give an immediate supply in case of necessity of 205,000 gallons.

Uniting utility and art in every department, with a cuisine presided over by a master, this pslace of lnxury has as patrons the noted personages of the world and the elite of our city. The lsrge number of sunny suits, with snrronnding appointments, has made this the popnlar place for families who desire the comforts of home and the luxuries attending a first-class hotel.

Connected with and a part of this grand edifice is

Baldwin's Academy of Music,

Which is the leading place of amusement of San Francisco. In its contour, arrangement and interior finish, decorative art, architectural design and elegant embellishments, have produced a gem of art combining comfort with luxury that reminds one of the oriental mag-

THE BALDWIN HOTEL, SAN FRANCISCO, CAL.

nificence of the palmy days of the Roman and Eastern empires. The Baldwin is situated in the heart of the city. The stores and hotel accessories are among the best, and, in many respects, the most attractive in San Francisco. The hilliard saloon, containing eight tables of the finest pattern, is the chief resort of disciples of the cue and of leading business men for recreation.

Barber Shop and Baths.

Messrs. Lampe Bros. are the proprietors of the Baldwin barber shop snd baths. This tonsorisl department and baths are, in their appointments and msnagement, equal to any in the United States or Europe.

Baldwin Cigar Store,

Of which Schlesinger & Green are the proprietors, import the best brande of Havana cigars, which are carefully selected to suit their patrons. They make a specialty of supplying choice brands by the box, and are the sole agents for the celebrated "Baldwin" 10-cent cigar.

Baldwin Clothing House,

Of which Psuson & Roman are proprietors, has a line of gents', youths' an l hoys' clothing and furnishing goods of a varied assortment, and of the finest quality. Tourists can find in this leading clothing house all the latest etyles and patterns to make up any kind of an outfit.

Millinery.

In this line, Mrs. A. Bassler & Mrs. E. L. Hevener have established a millinery palace snited to the place they occupy and their genteel pstrons. They are direct importers of French millinery, and are second to none in San Francisco as artietic and fashionable milliners. Having a large stock, they make a specialty in furnishing choice goode for interior cities and the conntry.

The Tallac House.

The attention of excursionists and tourists is called to the Tallac house, which has lately been thoroughly renovated, improved and furnished. This fine summer resort is beautifully located on the southern and sheltered side of Lake Tahoe, nesr Emerald Bay Soda Springs, Fallen Leaf and Cascade lakes, and amid magnificent scenery, shady groves, grassy meadows. Broad verandas encircle the honse; Chinese lanterns adorn the groves; swings, croquet, lawn tennis and archery gronnds; with fine drives through the valleys; good trout fishing; horses, carriages, boats and fishing implements at the command of guests. The table will be first-class in every respect. Billiard tables, piano, dance hall, and, in fact, everything possible for the pleasure and comfort of patrons will be found at the Tallac house. This well-known resort is now open. Fare from San Francisco, via Truckee, is $16.50.

Lake Tahoe.

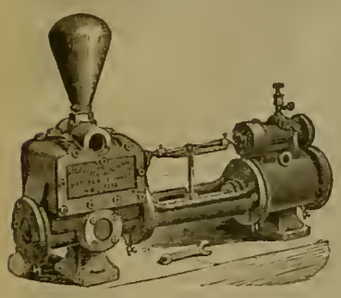
This lake is 1,700 ft. deep, is on a line between California and Nevada, is ice-cold and of crystalline clearness. Although hundreds of millions of gallons flow off through the Truckee river every day, the snpply is ever kept np by melting snow and great subterrsnean springs. Its fine b aches and shore groves of pine make it the most picturesque and attractive lake in the world. While calm, it is one of the loveliest sights conceivable—serenely beautiful—but during mountain storms its glassy bosom is lashed into white-crested billows, which dash in fury on its pebbly shore. To nnderstand its beauties, one must go there and spend some time. The route from San Francisco is via C. P. to Truckee, 259 miles, stage 14 miles. Passengers coming from the East and desiring to visit the lake, should leave the C. P. R. R. at Reno, then via V. & T. R R. to Carson City, and thence by Benton's stages, 18 miles, to Glenbrook, on the eastern shore of the lake, from which a steamer runs to the Tallac house, at the southern end of the lake, a fine hotel with magnificent surroundings. This house is owned by Mr. E J. Baldwin, of the famed Baldwin hotel.

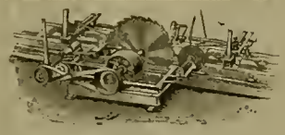
Tahoe trout, fresh from the cold waters of the lake, are served at every meal, and the visitor will find smple facilities in the way of boats and tackle to try his hand at the enticing sport of capturing the fish himself. It is in the form of a parallelogram, lying northeast and southwest, partly in Nevada and partly in California. At a distance of three miles from shore its depth is from 1,000 ft. to 1,200 ft. The greatest depth yet found is 1,800 ft. The water is so transparent that trout and other objects can be seen at the bottom, where the depth is from 80 ft. to 100 ft. Owing to the rarity of the atmosphere the water has little buoyancy. In order to swim in the lake one must be very industrious. Nothing is ever seen floating on the lake but boats or rafts of logs in transit. Stray logs, driftwood, and even shingles soon sink. The bodies of persons drowned in the lake never rise—are never seen again.

This celebrated lake is about 25 miles long by from 10 to 14 miles wide, and it forms a miniature inland sea. Its elevation above the sea is 6,700 ft., and the mountains which surround it are covered with snow for eight months ont of the twelve; its water never freezes, but remains about the same temperature throughout the year.

Grand old mountains stand about the lake like sentinels. Here is a feast of mountains for such as hail from level lands. On all sides they tower—mountains that are pine-clad and mountains that are hut stupendous piles of rugged granite. It is a region of granite. To the west rise mountains cold and stern, covered with snow, while on the north and east are mountains clothed in groves of pine, fir and spruce. The entire distance around the lake is 144 miles.

Lake Tahoe is the great sanitarium of the Pacific coast. It possesses climate, scenery snd means of health-giving pleasure to the careworn and debilitated, far ahead of any other place of resort. The business man is bound to forget his business while here. The scenery is too grand, the air too quieting and dreamy to allow business cares to absorb the attention.



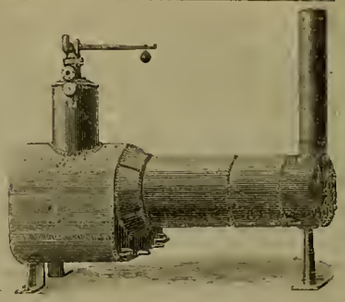


TATUM & BOWEN,

No. 12 California street, - - San Francisco;

—AND—

187 FRONT STREET, PORTLAND, OREGON.



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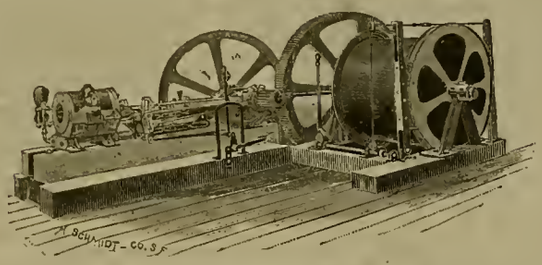

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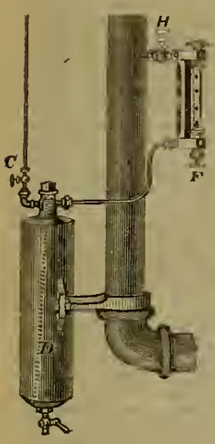

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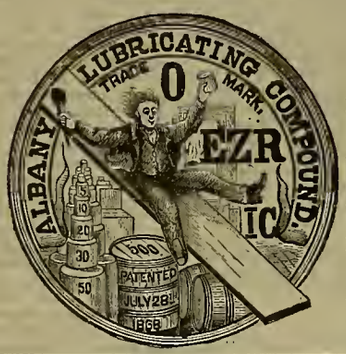

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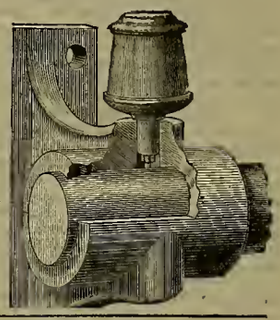

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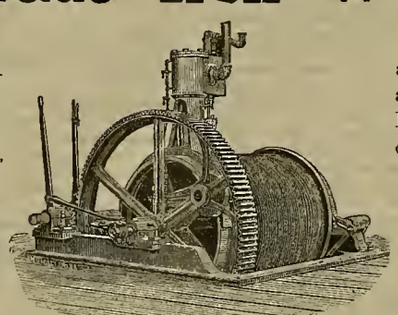

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The Mineral Springs of California.

(Continued from Page 391.)

analysis has yet heen made of the water, though an imperfect qualitative analysis is said to show the principal constituents of the two main springs to he, of the one, magnesia and soda, and of the other, the additional ingredient of iron, hoth heing impregnated with sulphnreted hydrogen. The Harhin springs are believed to possess the virtues of the weak thermal earthy-saline and chalyheate-saline sulphurons waters. Several obstinate cases of rheumatism, in the chronic stage, coming under the observation of the writer, have been materially benefited hy them, and they have been much recommended in some chronic uterine disorders, such as metritis with hypertrophy. As with most of our springs, we find, from personal observation, as well as from the reports of others, that no system or order is observed hy those nsing the water. Each visitor is free to exercise his own judgment, which he often does to his serious injnry.

Agua Caliente, or Warner's Ranch Springs.—These springs, which have acquired considerable celebrity in the southern part of the State, are located on what is known as Warner's ranch, in San Diego county, ahont 50 miles from San Diego city. They are thermal-sulphur waters, and are much resorted to hy those suffering from rheumatism, cutaneous diseases and dropsy. At the present time they are in charge of Indian families, who provide rude hnt, it is said, comfortable quarters for those who prefer not to camp ont. By the Indian nations of the conntry the Agua Csliente springs are regarded as affording an infallible remedy for all bodily ills; and an intelligent friend who visits the locality annually has informed the writer of what are supposed to he remarkable cures of chronic renal and hepatic diseases.

San Bernardino Hot Springs.—These springs, which belong to the calcareous thermal class, are situated five miles from the town of San Bernardino, and ahout 60 miles from Los Angeles, in an easterly direction. They are easily accessible hy the Southern Pacific R. R. from Los Angeles to Colton, and thence hy stage. They lie on the side of the San Bernardino mountain. There heing no other availahle account of theee springs, I sgain extract the report of W. F. Blake from the paper of the late Dr. Logan: The warm and hot waters gush out from the granitic rocks on the flanks of San Bernardino and adjacent hights. In one place the springs are so numerous, and the water rises in such volume, that a good-sized mill stream of hot water is formed, which flows down into the valley, and is one of the principsl tribntaries of the Santa Ana river. This brook of hot water retains a temperature of 100° Fahrenheit three or four miles from its source. In the immediate vicinity of the springs, however, no vegetahle growth was visihle. The rocks and gravel in contact with the water were covered with a snow-white incrustation. The white crust was not found in eqnal qnantities at all the springs. It appeared to he most ahundant at one of them. * * * An analysis of the crust, hy J. D. Easter, Ph. D., since the retnrn of the expedition, gave the following results: The aqneons extract contained ouly a small proportion of chloride of sodinm. In hot hydrochloric acid, the mass dissolved with strong effervescence, leaving a residue of silica and alumina. The solution contained: Lime (carhonate), chief constituent; silica (soluhle in acid); magnesia; alnmina and oxide of iron, traces; phosphoric acid, trace.

Gilroy Spring.—This spring is located in the mountains of Santa Clara county, ahont 30 miles from the town of Gilroy. The access from San Francisco is hy the northern division of the Southern Pacific R. R. to Gilroy, thence hy stage to the spring. The spring—for there is hut one principal spring—is situated in a little mountain valley snrrounded hy hills. The latter are harren and uninviting, except for the artificial adornments which have heen made hy cnltivation immediately around the spring. The spring itself is located near Coyote creek. The water is clear, hot, containing, according to an nnauthenticated analysis, snlphur, magnesia, iron, arsenic, and iodine. It is used hoth for hathing and drinking. Gilroy spring has a wide reputation for its efficscy in rhenmatism and cutaneons diseases, and has become a place of fashionahle resort. The locality presents ahundant sources of amusement and recreation —trout in the creeks, game of all kinds in the hills. The accommodations at the hotel, hoth at the tahle and in the sleeping apartments, are excellent.

Howard Springs, Lake County.—These springs are located ahout five miles from the "Adame" spring, and one and a half from "Seigler," about five north from "Harhin's" in a direct line hy trail. They lie in a flat or hasin at an altitude of 2,220 ft., surrounded hy hills covered with luxuriant pines. There are said to he 14 springs, hot and cold; the temperature varying from 58° to 109° Fahrenheit. Oue called the magnesia and potash spring, hot; a warm spring, said to he very strongly chalyheate, with some sulphur, hut which is highly ehsrged with carhonic acid; a "horax" spring, a "silica" spring, an "alum" spring, and others. All of these have heen named in accordance with the supposed predominance of some particular ingredient, there having heen no analysis made of any of them. Excellent hathing facilities have heen provided; a hot plunge hath, the temperature being not lese than 95° or 98°, and six hathhouses arranged in line, in which water of any ieired temperature may he obtained. Number one, the hottest, is said to he about 98°; number two, slightly less warm, and so on to nnmher six, which is cold. There is, in sddition, a very cold, sparkling and effervescing "soda" spring, so called, hut which is clearly acidnlous, which is much nsed as a heverage with syrup, or with the addition of a little hicsrhonate of soda and syrup, when it is drank during effervescence. The diseases for which these springs have heen recommended are mainly rheumstism, dropsy, renal and hepatic diseases. There is abundant evidence of their ntility in dropsy, dependent upon Bright's disease, and in nterine congestion.

Bonanza Springs, Lake conuty.—The locstion is upon the monntain side, among pines which surronnd and shade them, at sn elevation somewhat higher than thst of "Howard's," from which they are distsnt about one and a quarter miles. They are reached hy Napa railroad to Calistoga, and thence hy stage. There is a warm chalybeste spring, a sulphur spring and a cold plunge hath. These springs are not open for the accommodation of the puhlic, heing the property of a Mr. Duke, whose residence, during the season for visiting the watering-plsces, is on the premises. Parties camping out npon the surrounding hills may, however, avail themselves of the henefits afforded hy the water. The writer is not awsre of any analysis having heen made of either of the springs. They are used medicinally in renal snd hepatic disesses, rheumatism, etc.

Fulton Wells, Los Angeles Conuty.—Tbis pleasant resort is situsted about three miles north of Norwalk station, on the Los Angeles snd Anaheim railroad, and 13½ miles from Los Angeles city. There are two flowing wells of mineral water, hored to a depth of 350 ft. The water is cold, strongly impregnated with sulphur, and containing a considerahle quantity of carbonic acid gas. The grounds are the property of Dr. J. E. Fulton, an intelligent physician, who devotes his time to the improvement of the place, and the comfort and health of the guests. The salts are mainly held in solution as hicarhonates, the hicarbonate of iron amounting to 13 grains per gallon or 231 cubic inches. The waters from these wells has been found heneficial in cutaneous diseases, rheumatism and scrofnlons complaints. Benefit is also said to have heen derived hy those sfflicted with chronic indigestion. It acts gently upon the the howels, and decidedly npon the kidneys. Hot and cold baths are provided, and a swimming hath, the water in which is heing constantly re-newed, ahout four ft. deep and 40 ft. in diameter. The following is the analysis of the Fulton wells.

In one gallon of water.	Grains.
Bicarbonate of soda	2.20
Bicarbonate of lime	12 00
Bicarbonate of magnesia	16.50
Bicarbonate of iron	13.00
Sulphurate of soda	.90
Chloride of sodium	10.40
White sulphur	23.00
Total	78 00

Sulphurated hydrogen gas and carbonic acid gas in abundance.

Santa Barhara Hot Sulphur Springs.—The drive from Santa Barbara to these springs, a distance of ahout five miles, is through a canyon shaded with thick foliage, and surrounded hy wild and varied scenery. From the springs themselves the prospect is heantiful, commanding a view of Santa Barhara and the mountains, on the south and sonthwest, and the hroad ocean on the west. The location is near the head of the canyon, nearly 1,500 ft. above the sea, and the atmoephere pnre, dry and invigorating. Although the writer has visited the springs himself, the account given of them hy Dr. M. H. Biggs, of Santa Barhara, as recorded hy the late Dr. T. M. Logan, will give a better idea of their character than would he conveyed by the record of a single hasty examination: "It is said that while this country was in possession of the King of Spain, a corps of scientific men was sent out to this coast, commissioned, among other things, to test the properties of the several mineral springs known to abound there; and, in their report, they pronounced the Santa Barhara hot sulphnr springs to be the hest and most medicinal, and snperior to any other in California 'for the cure of many diseases.' Whether they came to this oonclnsion from actnal analysis or from simply witnessing their effect, is not known. Certain it is that at the preeent day they are hecoming famous for their curative effects in many cases of rheumatism, paralysis, various diseases of sypbilitic origin, and skin diseases generally; and from persistent use of the waters (drinking and hathing) many individuals have heen cnred of such affecciosa." A large, deep spring, or excavation, is used as a plunge hath for those who desire it. The locality of these springs is adapted for a resort for those snffering from other diseases than those to which the water is applicahle. The dryness of the atmosphere, the altitude of the place, and its exemption to a very great extsnt from the northwesterly currents which prevail below, make it a snitahle place for the victim of consumption in its early period of development. It possesses, even in a more marked degree, the advantages usually ascribed to the climate of Santa Barhara.

Wilhur Springs.—These somewbat noted springs are located in Colusa conuty, prohahly about 30 miles from Colusa. The water helongs to the hot sulphur class, and contains carhonate of soda and sulphates. The following ie an analysis of this spring:

Acids.—Sulphuric, 29.05; muriatic, 19.20; hydriodic, 7.10; alumina, 9.48; free sulphur, 30.07. The acids combine with the bases as follows: 1. Sulphate of potassa; 2. Sulphate of soda; 3. Sulphate of iron; 4. Sulphate of alumina. Hydriodic acid is set free without change.

1. Muriate of potassa; 2. Muriate of soda; 3. Muriate of iron. The iron is in a natural state of oxide—the sulphate of the protoxide.

The water has attsined a reputation in rbeumatic and cutaneous diseases, and other complaints to which springs of the kind are nsually adapted.

Simmons' Hot Snlphnr Springs.—Located not far from the above in Sulphur canyon, in Colusa county. Tbey are stronger in sulphur than the Wilbnr Springs, and one is said to have a temperature of about 170° Fahr. No analysis has heen reported.

Byron Springs, Contra Costa County.—These springs, although hut recently hrought to the notice of the puhlic, have already acquired considerable reputation. There are said to be numerous springs, sulphnrous and saline, hot and cold. Some of them are sctively cathartic, others diuretic; some sparkling witb carhonic acid, others containing sulphnreted and pbosphureted hydrogen gas. They are said to have been found useful in the diseases to which mineral wsters of this kind are nsually adapted—in rhenmatism, and in renal and hepatic affections. They are located ahout a mile from Byron station, on the railroad from Martinez to Sacramento, and near the base of the Mount Diablo range, and of easy access from San Francisco or Sacramento.

The Geysers.—These springs, about which so much has heen written, snd which form an object of so much curiosity among travelers from the Eastern States, as well ss among the people of California, are located in Sonoma conuty, in a deep gorge of the mountains, through which runs Pluton creek, and ahout 1,700 ft. above the sea. They consist of many springs, numbered hy hnndreds, extending along the canyon for a dietance of a mile or more, the temperature varying from 200° to 210° Fahr. Then, near hy, ahout three or four miles up the canyon, are the "Little Geysers," consisting of several springs, at a temperature of from 190° to 200° Fahr. Down the canyon, only a mile or two distant, are the "Indian Springs," so named from their having been the resort of the Indian tribes of this vicinity, and from which Edwin Forrest, while in California, was supposed to have derived much henefit. They are not original springs, hut are snstsined hy the nnion of three streams from the Geysers themselves—the snlphurous, the chalyheate, and the aluminous. These springs are much lauded hy the local residents for their efficacy in chronic rheumatism. No analysis, so far as known, has heen made of the water. Also, unanalyzed, four or five miles up the canyon, are the "Blue Lick Springs," closely resemhling the springs of the same name in Kentncky.

The Geysers, at the present time, are objects of curiosity, rather than of medical interest, though the water of some of them possesses active medical properties—epsom salts springs, iron springs, soda springs, alum springs, and many others in which some ingredient is supposed to predominate. There are aleo cold water springs, and facilities are sfforded for bathing—hot or cold—or these successively.

Unclassified Springs.

Highland Springs, Lake County.—These springs are sitnated in Lake county, ahout seven miles from Lakeport and Clear lake, at an altitnde said to be about 1,700 ft., free from fogs, and in a climate which, like almost all parts of Lake conuty, is remarkahle for its healthfulness. Good accommodations have been provided for guests in the hotel and in cottages. The springs are of easy access from San Francisco hy steamer to San Rafael or Donahne, thence hy the S. F. and N. P. R. R. to Cloverdale, in Sonoma county, and thence hy stage 16 miles. No analysis has been made known, so far as the writer is aware.

Other Springs.—Other springs have been reported, supposed to possess medicinal virtue. One on the mountain near Silver Lake, in Amador county. It is a cold, saline spring, strongly chalybeate. Prof. Price, to whom I am indebted for a knowledge of it, states that it is more highly ferruginous than almost any of the springs of this State.

Another, a soda spring, on the west side of Clear lake, in Lake conuty.

Another, a saline cold spring, in the Sierra Nevada mountains, near Falling Leaf lake. A quantitative analysis has been made, showing the presence of carhonate of soda, iron, magnesia and lime.

The Magnetic spriug, near Watsonville.

Mark West Springs, Sonoma county.

Anderson's Springs, 19 miles from Calistoga. There are hot and cold eulphur springs. No analysis known.

Paraiso Hot Sulphur Springs, Monterey county, six miles from the terminns of the northern division of the Southern Pacific railroad. Said to contain soda, sulphur and iron.

Piedmont White Sulphnr Springs, three miles from Oakland. A pleasant place of resort. No analysis has heen made known.

The following analysis has heen sent me of what purports to he a mineral water discovered in Inyo conuty, Cal.:

Volcanic Mineral Spring.—This remarkahle spring is said to he located in Inyo county, sonthern California, in what is called Death's valley. If genuine, it is the most wonderful natnral water supply which has ever heen brought to the notice of the writer. It is a cold spring. The following analysis hy Dr. Price has been furnished, the figures giviug results in grains per gallon:

	Grains.
Chloride of sodium	1,840.12
Chloride of potassium	132.30
Carbonate of soda	1,724 11
Sulphate of soda	651.62
Sulphide of sodium	46.34
Lime and magnesia	traces.
Silica	14 24
Organic matter	13.48
Iodine and bromine	traces.
Iron	traces.
Boracic and phosphoric acids	traces.
Total	4,422.25

The water, of which the foregoing is an analysis, is a very remarkahle one, heing at once a sulphur, salt, carhonate, alkaline and slightly ferrnginous water. The digestive snd nriuary organs are specially affected hy alkaline waters; the liver and the slimentary csnal hy saline ones. The skin and mucous respiratory membranes are, according to the hest medicsl authorities, influenced hy sulphur waters, while a special action on the blood has always heen attributed to ferruginous sources. When used either internally or externally, it is directed thst the water he diluted with pure water. Internally, the dose is fixed at a teaspoonful in a wineglassful of water; externally, it is mixed with one or more parts of water. In its pure state it has a hitter, saline and acrid taste. It is highly praised for its curative properties in rheumstism, catarrhsl affections, diseases of the kidneys and liver, dyspepsia snd neuralgis. It is powerfully purgative with some, bnt with others not at sll so.

Route to the Yosemite From Nevada.—Tonrists seem to think that when they have heen to Yosemite valley and the Big Trees, with a flying trip to Tahoe, that they have "done" all the wonders of the Pacific coast. In this conclusion they are away off. For four months in the year tourists can reach Yosemite from this side of the mountains. Taking cars at Reno, the trip down the C. & C. is not devoid of interest. From Hawthorne to Bodie is hut 37 miles, and from there to Mill Creek canyon 25 miles. The ride from Bodie to Lundy is full of attractions. Several of the highest mountsins of the Sierra are in sight, with Mono lake on one hand, and grand old Castle Peak towering 13,000 ft. high on the other. But the grandest of all mountain trips in the world is through Mill Creek canyon and Tioga district to Yosemite valley. There are changing scenes of awful grandeur along this route wbich excite continual wonder and admiration; heantiful lakes and streams teeming with trout, and game in ahundance. The trip from Lundy to the valley of the Merced, can he made leisurely on horsehack in two days in summer. Some enterprising man will, hefore long, put on a train of saddle animals hetween these two points. When one party goes over it, the route will advertise itself. The expense of the trip will he less than hy the usual route.—*Reno Gazette.*

Philadelphia Mining Affairs.—Mining affairs in this city are not characterized hy any really startling advance or improvement. A heautiful state of uncertainty pervades the whole market, and prices keep tumhling; the owners of shares inwardly groan, and the bears are juhilant. The proepects are anything hut promising at the present movement for the advancement of the mining interests in this section, and will continue to the had until the common sense and honesty are more strictly adhered to than they have been for some months, by the promoters and (not) protectors of the various mining companies' interests.—*Bullion Miner.*

By the hurning of the Giant smelting works, at Leadville, the largest smelting works in Colorado were destroyed. The production of bullion of the smelter for last year amounted to over $4,000,000, and this year, if the works had remained standing, the output would have been largely increased. The main building was 350 ft. long hy ahout 150 ft. wide, hesides numerous charcoal and coke hins, which were all destroyed. The loes, as stated hy Mr. James, amounts to $400,000, with an insurance of only $65,000.

The Utah Mines.—The mines of Utah, says the Salt Lake *Tribune*, are making a record this season which will surprise tne expectations of the most sangnine miner. Twelve millions in solid hullion, taken from the hills in twelve short months, is something to make the heart glad. This is what the Gentile miners of Utah will accomplish in the year of our Lord 1882.

The Music monntains are located in the north-western portion of Arizona, hut owing to no known water springs, prospectors have, until lately, feared ventnring among them. Prospectors have at last gotten into these mountains and uncovered gold ledges.

Wells, Fargo & Co. have acqnired 3,500 miles of additional route, hy transfer from the Adams', American, and United States Express companies, which acquisition gives them control of the express husiness in the entire section west of the Missouri.

The Union Pacific isn't letting the grass grow nnder its enterprising tracks this season. Beside its Oregon Short Line, it will complete about 300 miles of new road in Colorado. It is expending millions of money and opening millions of acres of new country to settlement.

The Debris Question.

Full Text of Judge Temple's Decision.

We append the full decision of Judge Temple in the famous Gold Run suit, which has been so long pending. The suit took some 45 days to try, and the testimony adduced was not only very voluminous, but very contradictory in its character. Naturally, the decision will not please the mining community, but a grain of consolation appears in the concluding paragraph of the decree, because the heavy bowlders, cobble stones and heavier sand *can* be held back. In addition to our eight-page supplement, we print four pages extra this week, to admit of giving the decision in full:

The Findings of Fact.

In the Superior Court, Sacramento county, California. The people of the State of California, plaintiff, vs. the Gold Run Ditch and Mining Company, defendant.

This cause was tried by the court, a jury having been waived. Having fully considered the evidence, I now find the facts as follows:

First.—The Sacramento and American rivers are wholly within the State of California; the latter is a tributary of the former, flowing into it about one mile north of the city of Sacramento.

Second.—The Sacramento is navigable, and has been continuously navigated by steamers, barges, schooners and smaller craft, and up to 1862 was navigated as far as the city of Sacramento without difficulty by steamers of deep draft, to wit, by boats drawing nine or 10 ft. of water. That said river has been declared navigable by law to the mouth of Middle creek, which is above the confluence of the American and the Sacramento. That since 1862 the navigation of said river has been seriously impaired by deposits of mud and sand therein, which have in part come from hydraulic mines; so that now the city of Sacramento can be reached by boats of deep draft during the high stages of the water only, instead of at all times, as formerly.

Third.—That hydraulic mining, as that term is generally understood, consists in washing and removing from their natural positions into the water-courses and rivers, by means of water, high banks of earth and gravel containing gold, and thereby separating the gold from the earth, seeding the residue, consisting of bowlders, cobble-stones, gravel, sand and clay, into the water-courses, the larger portion of which finds its way into the principal confluents of the Sacramento river, and is deposited along said streams from the place of discharge or dump to San Pablo and San Francisco bays, the heavier material being first deposited.

Fourth.—Hydraulic mining has been practiced for 20 years to some extent in the mountains of the Sacramento basin. It attained great magnitude as an industry before 1875, and is still extensively carried on, principally in the counties of Butte, Yuba, Sierra Nevada and Placer.

Fifth.—The tailings from some of the hydraulic mines are deposited in the North Fork of the American river, and large quantities thereof have been deposited in the channel of said North Fork and of the American river, throughout its entire course, and a large portion thereof has been washed and carried down into the Sacramento river. That the tailings from other hydraulic mines are washed and carried into the Middle and South Forks of said river, and in the Yuba, Bear and Feather rivers, which are tributaries of the Sacramento.

Sixth.—That the tailings and deposits from said hydraulic mines, with other matter carried by the waters of said rivers, has filled up and raised the bed and channels of said Sacramento river to a great extent below the mouth of the American river, to wit, from 6 to 12 ft., and has filled up and raised the American river below Alder creek from 10 to 20 ft., and in places even more. Such filling has been materially increased by the tailings from the hydraulic mines.

Such fillings have shallowed the channels of the Sacramento river, and materially impaired the navigation thereof, and has materially increased the liability of the Sacramento river and of the American river below Alder creek to overflow their banks, and has caused the frequent floods in said rivers to be more destructive than they otherwise would have been.

That the debris from mines, including the mine of the defendant, has materially contributed to such filling of the river channel, and thereby has interfered with and obstructed the free and comfortable use and enjoyment of large portions of the land upon the American and Sacramento rivers.

The American river is, however, obstructed by the levees and the levee system on the Sacramento, which cause the water to be dammed up and made to flow back into the American river and over the banks thereof, during the stages of high water in the Sacramento, and thereby large tracts of land are submerged and heavy deposits made thereon, which would not exist but for such levee system, or the defects in the same. That one of the principal sources of damage by the overflow of lands on the Sacramento river is from the erosion of the bank nearly opposite the mouth of the American river and the break in the levee at that point. That the more immediate cause of this erosion and break was the change in the course of the American river, which manifestly would have produced the break and much consequent damage although all mining operations had been suspended.

That during the highest stages of the water of the Sacramento the channel of said river is insufficient, and even if it had not been filled up would have been insufficient to carry one-half of the volume of water sent down by its various confluents, and at such times would break the present levees, even though no mining were carried on.

Still the mining debris does increase and aggravate all these evils, and renders the problem of controlling the streams and the protection of the valleys more difficult and expensive, and causes more land to be injured and the free enjoyment thereof to be interfered with than would have been interfered with or injured but for such mining debris.

Seventh.—That defendant is, and since August, 1870, has been, a corporation under the laws of the State of California, for the purpose of mining by the hydraulic process and selling water to miners and others. That it is now, and for several years last past, it and its predecessors have been in possession of certain mines and mineral land situated adjacent to the North Fork of the American river, on the north side thereof, near the town of Gold Run, in Placer county, and consisting of about 500 acres of land. The surface of said land is about 1,000 ft. above said North Fork of the American river. All the material of said mine is capable of being worked off into said American river, and consists of about 20,000,000 cubic yards of material, composed mostly of sand, gravel, small stones, cobbles and bowlders, mixed with small particles of gold.

Eighth.—Defendant, by means of ditches and iron pipes, has conducted to its aforesaid mines a large quantity of water, which it is using and will continue to use under a vertical pressure of several hundred ft., to mine its said tracts of mining land by the hydraulic process, discharging water through Little Giants and Monitors, and dumping all the tailings from such mines into the North Fork of the American river.

Ninth.—Said defendant has been mining its said tracts of land for about eight years past in the mode and process aforesaid, and up to the time of commencing this action, and during about five months of each year of said period, has been daily discharging into the said North Fork between 4,000 and 5,000 cubic yards of solid material from its said mine—to wit: of bowlders, cobbles, gravel and sand, making a yearly discharge of at least 600,000 cubic yards, and will continue to discharge that quantity annually, if the working of said mine is permitted to continue, and at such a rate, it will require some 30 years to mine out and exhaust said mineral land.

Tenth.—That a large portion of the material so dumped by the defendant into the North Fork of the American river has been washed down said river by the water and commingled with tailings from other hydraulic mines, and still other material, which is the product of natural erosion, has been deposited in the beds and channels of the Sacramento and American rivers, but mostly in the American river, and upon the lands adjacent to said rivers; and by said mining of the defendant and other mines the filling up, raising and shallowing of said rivers has been materially increased, to the impairment of the navigation of the Sacramento river, and to the excessive overflow of the lands adjacent to said rivers, to the great injury of said land, and damage, discomfort and annoyance of a great number of citizens of the State, owners of said land and residents of said valley.

Eleventh.—That the power of water to preserve its channels and to clear out and to carry off deposits in the same is proportioned—other conditions remaining the same—to the depth of the stream and the freedom of said water from earthy matters.

That the beds of said rivers have already become so widened and filled that the depth of the water therein has been greatly lessened; that said water, at all times, is heavily laden with earthy matters, chiefly from mines; therefore, said rivers are likely to fill more rapidly in the future, in proportion to the quantity of hydraulic tailings, than in the past.

That thousands of acres of good land in Sacramento valley have already been covered by such debris, and, if some preventive is not applied, much further and greater injury is likely to ensue in the future, and large tracts of land will probably be rendered, within a few years, unfit for cultivation and inhabitancy.

Twelfth.—That the discharge from the defendant's and other mines so fouls the water of the American river at all points below, as to render said water unfit for any domestic use by the inhabitants.

Thirteenth.—That the filling of the beds of said rivers has, to some extent, obstructed the natural and artificial drainage of the valleys of said rivers, and has interfered with the percolation and flow of the water through the soil, and has raised the soil water to such an extent as would naturally increase the tendency to malarial diseases; but I do not find that heretofore, it has had any effect on such diseases, and the material carried down by the rivers is singularly free from matter which could ferment and induce malaria.

Fourteenth.—That if the said acts of defendants and others, mining as aforesaid, are allowed to continue, there is imminent dangor that the beds and channels of the lower portion of the American river, and of the Sacramento river below the mouth of the American, will be so filled and choked up by tailings and other deposits that said rivers will be turned from their channels, cutting new waterways, injuring or destroying immense tracts of land, and probably will result in greatly imparing the navigability of the Sacramento river.

Fifteenth.—That the filling in of said rivers below Alder creek has been accumulating from year to year. The largest deposits were made by the floods of 1861 and 1862, since which time there has been a steady increase in deposit and a slow but constant working down in the channels of the rivers of the heavier material; that it is not possible to determine the proportions of such deposits which come from mines now working in other sources, but it is quite probable—in fact, almost certain—that very much the larger part of that which injuriously fills the rivers is composed of material dumped into the river from mines within 10 years previous to the fill in the river.

Sixteenth.—That the waters of the American river and its tributaries, during the recurrence of high water in each year, move and transport portions of the debris then in the river further down the stream, and most of such matter finds its way ultimately below Alder creek, which is a point in the American river near where said stream emerges from the foothills, about 27 miles above the mouth of said river.

Seventeenth.—The grade of the American river above Alder creek to Canyon creek is about 30 ft. per mile, and below Alder creek is not more than three ft. per mile.

The mine of defendant is about 83 miles, by the river, above Sacramento, and is a blue-gravel mine, and constitutes a portion of the ancient river channels which cross the present river system diagonally.

Eighteenth.—That the Gold Run mine, in 1854, was within the mining district known as the Gold Run district.

That mining rules and regulations were in force in that district, as in all other districts in this State, which prescribed the size of the mining claims, the manner of locating and recording them, and the amount of work to be performed to enable the locators to hold their claims.

Miners' rules and regulations had no force beyond the district.

Claims in the Gold Run district were in small parcels, about 100 000 square feet, and were taken, held and worked by a large number of persons, commencing such work in some of the claims as early as 1852, and were so held until sold to defendant, which has since acquired title to said lands by means of patents from the United States.

That between the years 1854 and 1874, the upper levels of the Gold Run mines were practically all worked off, leaving the lower portions thereof next to the bed-rock to be worked off. Such lower portions now constitute the mines of the defendant, and yield in gold from 5 to 20 cents per cubic yard.

The mining and ditch property cost the present company $253,000, including tunnels and all improvements in the same.

Nineteenth.—The rules and regulations of miners did not purport to regulate the manner in which mining claims should be worked, nor the manner or places in which the mining debris should be dumped; but the universal practice was to discharge the tailings into the most convenient stream or gulch, even though it should interfere with claims located in the streams or ravines below.

It has been a custom, almost universally acquiesced in, in the mining communities of this State, to regard the streams as common ways or the discharge of mining detritus. The exceptions being where such stream has been previously occupied by some works, such as a ditch to convey water. Such right on the part of the mine-owners is, in most cases, essential to the economical working of the mine.

Such practice is necessarily confined to the mining localities and has not been recognized or acquiesced in elsewhere, except that the waters of the streams throughout their entire course have been rendered turbid and foul without complaint until within the past few years.

Twentieth.—That neither this State nor the United States has licensed the defendant or any mine to dump his tailings into the streams so as to be transported into any navigable river, stream or bay, nor has this State legalized the same.

Nor have the Sacramento or American rivers been dedicated to the use of miners as a place of deposit, or for a way to transport mining material, nor is either cause of action set forth in the complaint barred by the provisions of Secs. 315, 338 or 343 of the Code of Civil Procedure of this State, or of either or any of said sections.

Twenty-first.—That the acts threatened to be performed by the defendant in continuing to prosecute its mining industry in the manner set out in these findings, as it will do, unless restrained, if allowed to be done, will, in connection with like acts by others, obstruct the navigation of the Sacramento river, and fill up, to some extent, Suisun bay, destroy or injure large amounts of land, and constitute an obstruction to the free use and enjoyment of the property of a large number of citizens of this State.

Twenty-second.—Ancient gravel channels exist, at least 200 miles in extent, from Mariposa county to Siskiyou, crossing the present river system diagonally and at higher altitudes. These channels are from 200 to 2,000 ft. wide, and contain gravel sometimes several hundred ft. deep. Gold is distributed quite uniformerly throughout the length of the channels. The first mining was generally in the present rivers below where they had washed out the old channels.

Competent persons estimate the entire product of gold from California mines at $1,154,689,036 up to June, 1881, $900,000,000 being from the ancient channels. The present yield varies between $15,000,000 and $20,000,000 per annum, and there is no doubt much more gold still remains in these ancient channels than has been washed out.

Present investments in California mines are estimated at $150,000,000, $100,000,000 of which is in hydraulic mines. Some portion of this is, no doubt, in mines which cannot be profitably worked.

Mining for gold is the principal industry in 15 counties of the State, and the population of the mining counties is over 100,000.

In the past eight years the amount of material washed from hydraulic mines has diminished, owing to change from washing light surface gravel with few bowlders to heavy bottom gravel, and from steep grades in the sluices to light grades.

The amount washed from a mine will depend upon the amount of water used, the character of material and grade and size of sluices.

Late improvements in hydraulic mining do not increase the amount of material mined.

The various mines in the drainage area of the Sacramento river have reservoirs in which they store about 7,600,000,000 cubic ft. of water, which is gradually drawn off in the five months after the middle of July, and to that extent increases the flow in the Sacramento river.

General Finding.

To the foregoing findings of fact I desire to add a general finding, explaining, amplifying and perhaps to some extent qualifying them.

The case involves the consideration of the operation of natural forces on a large scale, and many conclusions are necessarily to some extent matters of theory or opinion. Conclusions upon such matters when expressed in legal findings often seem to imply a certitude which does by no means exist.

The field of observation is so vast that the full case cannot be presented in the findings; much must be left unexpressed, being presumed to be within the judicial knowledge of the Court; as, for instance, the geography and generally the geology of the country over which our inquiries have extended; the nature of the ancient river channels and the different forms and methods of mining which have prevailed, as well as the general history of the country—matters which everyone is presumed to know.

THE AMERICAN RIVER.

The drainage area of the American river is 1,889 square miles, mostly on the western slope of the Sierra Nevada mountains. This slope is composed of numerous deep canyons and ravines, high and steep ridges and lofty mountains. The formation is mostly granitic, is largely covered with deep soil, generally of decomposed granite.

Originally, there were very extensive forests of immense pine trees. Since the settlement of the country there has been a continuous destruction of these trees for the lumber, although large forests still remain. Numerous roads have been cut and trails made within this area. Considerable industries in fruit raising are carried on in some places, and every summer thousands of sheep are driven from the valleys into the mountains to be pastured.

As early as 1852 there were mining in the American river, in Placer county, 20,000 men, and in El Dorado county, 40,000. The earlier mining was in the bars and beds of the river or its tributaries, or in the dry diggings, which were probably older bars made in former geologic periods. The work was chiefly in mining the gravel and sand composing the river bars into the river, generally leaving the heavier cobbles in the claims.

The so-called dry diggings were worked during high water. Much of the material being light soil, was sent down the stream, leaving innumerable small pits and piles of debris on the slopes of the mountains.

In the winters of 1852 and 1853 there was

A LARGE FLOOD,

But from that time until the winter of 1861 and 1862—the memorable flood year—there was no flood of moment.

Of course, at this time, an enormous amount of material would naturally be exposed to the transporting power of such deluge, and, accordingly, we find that for the first time the inhabitants of the valleys become aware that the water was filled with sediment which menaced the navigability of the rivers, and which left large deposits of sand upon their margins. It is probable that more sediment was brought down by the river during that year than any year since.

It is contended by the defendant that most of the sediment in the river is from other sources than mining. Perhaps this is not so important an inquiry as it is deemed. What proportion of sediment is from mining, and what from other sources it is impossible to determine; but it probably may be safely claimed that the greater portion is from mining deposits made within the periods of the recurring high floods, which are from 8 to 10 years apart.

The Sacramento might be expected to bear 19,000,000 cubic yards of sediment, independently of mining debris, per annum. The drainage area of the American river is about one-

twelfth of the Sacramento hasin. The erosion upon the American river would, however, naturally he much above the average. Let it he placed at twice the average, and then natural erosion cannot he held responsible for half the material which is carried in suspension to the Sacramento, and which is rolled along the bottom of the river, at least helow Alder creek. Again the character of the material is

AN IMPORTANT CONSIDERATION.

Generally the wash from other sources than mining is the very lightest material; the exceptions are land slides and sudden cutting of gullies on the hill sides. The wash from such sources, therefore, would he easily managed by the great volume of the lower rivers, and would he carried in suspension to Suisun bay, which is the great settling reservoir of the hasin. The damage to the rivers or the adjacent land would he slight.

Mining dehris, however, is of all degrees of fineness. The question as to what will he carried down will depend upon the size of the rocks which the water has sufficient force to roll along. In other words, it will furnish the heaviest material which can he transported. This is just the material which naturally fills the rivers below the foothills more or less permanently while slowly but constantly creeping further down the stream.

It is probably from this source mostly, rather than from causes other than mining, that the material has come which has filled the channels of the Yuha, and the Bear, near their confluence with the Feather.

It is contended hy the defendant that all the dehris which it puts into the American river (save a small per cent), remains permanently above Rice's hridge—a point about nine miles below Canyon creek—and no question in the case has heen more minutely examined. This portion of the river is through a rocky gorge with hanks sloping at an angle of from 30 to 40 degrees.

According to a profile furnished hy the defendant, the grade of the original hed from canyon creek for about two miles, was over 70 ft. per mile; then for a distance of over four miles the average grade was a little less than 40 ft. per mile, with occasional spaces of several hundred feet each, in which the grade was ascending. The remaining distance the grade was about 21¼ ft. per mile. There is a large fill now in the river, commencing about one-half mile helow Canyon creek.

THE SURFACE GRADE

Of the present hed for this portion of the first section which contains any fill one and one-fourth miles is 46 ft. per mile. The grade of the next four miles is 40 ft., and the remainder over 36 ft. per mile—the last quarter of a mile being 25 ft. per mile.

Prior to the commencement of the work in the present pit, or lower portion of the mine, it is estimated that there had been washed from the upper, or old washings, 67,000,000 cubic yards of material, which also come into the American river through Canyon creek. Also large quantities of material were placed in the same sections of the rivers from the Iowa Hill mines.

The surfaces of the old washings was principally light red earth, with sand and pipe clay. In the channel, however, the old washing was chiefly composed of gravel, sand and cobble stones.

The old mines ceased to he operated because, as the miners say, they ran out of grade, and not because of a change in the character of the material. The banks are of a mixed character of sand, gravel and cobbles, from the top to the bottom. In the present pit, however, there is no pipe clay in the ribhon or channel which will he worked, and none of the red earth, and there is a constant increase in the average size of material as we approach the red rock. There was no clear line of distinction hetween the present and old washing. The great proportion of material in the lower pit, therefore, cannot reasonahly be heavier than 10% of largest material in the old washing. It seems that, prior to 1875, this portion of the river was filled with this dehris to a much greater depth than at present. All this material was washed out and went down stream, as also vast quantities of material put in from the Iowa Hill mines.

The material in the river is naturally graded as to size down stream; the heavier being first lodged, and then the next in size, and so on.

THE HEAVIER MATERIAL,

Therefore, cannot hold hack the lighter dehris which has been separated hy the water, and is constantly washed lower down. If all the detritus from the top washing has gone down over the lower grades of the original bed, certainly that portion of the material in the present pit, which is not heavier than the largest cobbles in the old washing, will pass over the present increased grades of the river, if we suppose that the hill now there is so impact that it will remain.

But I think it altogether probahle that the profile is incorrect. The surveyer who made it is evidently competent and apparently candid, but he did not measure the depth of the fill. The estimate must he very much in excess or considerable of the old fill must still be there. In either event the case must he taken as established against the defendant—that a considerable portion of the material will and does come down the river.

It may he added that at high water the current of the river at this point must have a velocity of at least from six to eight miles per hour. There are few cohhles or howlders which will exceed 10 inches in diameter. Theoretically they would all come down.

THE CONDITIONS IN THE AMERICAN RIVER

Differ widely from those at the Polar Star dump in Bear river, aside from the fact that the material at the Polar Star is heavier and the stream of less force. At the Polar Star, if I have rightly understood the evidence, the fill is immediately at the dump, some of the material rolling up stream above the point of discharge.

The larger howlders, therefore, do hold hack the lighter material. At Canyon creek the material, after it reaches the river, is transported by the water from half a mile to six and eight miles before it finds lodgment, and is, of course, completely graded hy the action of the water. It settles on a steep incline and is so distributed as to huild up the hed of the river to a uniform grade. It forms nothing like a dam, hut at the upper end rests against the steep grade so as to form a continuous incline, over which most of the material passes, even at ordinary stages of the water while the mine is working. I think it may he assumed that the new grade at Pickering's Bar—40 ft. to the mile—is just the grade over which the very heaviest material of the mine will not pass at ordinary winter stages of the river. It certainly all passes over the grade from Canyon creek to Pickering's Bar, and will continue to he completely sorted hy the water, and therefore, as it seems to me, a large portion of it must inevitably come down.

THE COARSER MATERIAL

Will travel very slowly, probahly requiring many years before it reaches Alder creek—10, 20 or more, according to the size. No doubt much which was thrown into the river many years ago is still slowly moving down and, though all mining should cease, will continue to come for many years. This is important, as showing to what extent stopping the work at the mines will afford a remedy. It appears that this part of the injury is easily remedied, and at comparatively little expense, hy the erection of dams to impound the dehris. If the experts are correct in their conclusions—and I am bound to so conclude—all that is very greatly injurious could he so impounded.

Of course during its slow journey the detritus is very greatly comminuted; much of it will he carried off as clay in suspension; the proportion cannot he determined.

On the American river, and its tributaries, a vast amount of mining was done in early times, and up to this time a great deal is being done heside that hy the defendant. No other mine contributes annually more detritus to the river than the defendant; still I am unable to say that defendant's mine alone, without reference to the dehris from other mines, materially contributes to the evils mentioned; or, in other words, if there were no mining operations save those of the defendant, I am not prepared to say that it would materially injure the valley lands or the navigation of the river. It is the aggregate of dehris from all the mines which produces the injuries mentioned in these findings.

The lower portion of the American river is very much filled with dehris, and has been, in places, much widened. As yet, however, no such state of things exist there as is seen in the Bear and Yuba near their confluence with the Feather. Perhaps if it were not for that instructive lesson we should not he justified in anticipating all the evils which may yet flow from these constant accumulations.

ABOUT ONE THOUSAND ACRES

Of valuable farming land have already been covered with heavy sand along the margin of the American river, and the adjacent lands are subject to frequent overflow.

The overflows would probably occur to a considerable extent, although there were no mining. Very much of the trouble from this source comes from back-water from the Sacramento.

In flood times, if the rains have been general, the American is the first to rise. The Sacramento then heing at its low state, the flood rushes out loaded with sand and mud, and, with very great velocity, is precipitated on the Yolo shore, and there covers large tracts of land with its sediment. At such times the current is much greater than at any other time, and, of course, a great deal of sediment which has accumulated in the river during slack or low water is carried out.

About 15 hours after the rise of the American, the flood from the Feather, also surcharged with mud, reaches Sacramento, and 36 hours later the floods of the upper Sacramento. By this the current of the American is checked, and considerable land sometimes remains submerged by back water. At such times, of course, sediment is left both on the lands and in the channel of the river, which otherwise would have gone off in suspension.

SACRAMENTO RIVER.

The plane of low water has heen raised about six and one-half feet since 1849 in the Sacramento. The rise in the low-water plane has heen continuous since 1868, when the low-water mark was about two feet above the low-water plane of 1849, although in some years, probably for special reasons, it has been higher than in the succeeding year.

This indicates that the bed of the river at the shoals has been filled at least six and one-half feet, and probably much more. The consequence is that the influence of the tide is not felt above Haycock shoals—nine miles below the city—it formerly heing about two feet at Sacramento.

As we go down the river there is a less elevation of the low-water level, indicating an increase in the grade of ths river, from which will follow additional force to carry off the sediment.

The levees of the river are insufficient to carry one-half the water during the periods of the higher floods. Breaks are, therefore, inevitable, and perhaps have caused, insome localities, greater damage than would have occurred had there heen no levees. The levees, to some extent, increase the scouring force of the water, hut not so much as would he the case if the water were not at its high stages already surcharged with sediment. The levees, also, somewhat prevent the river from wasting its material along the hanks and building up the valley as it builds its own hed, and causes it to carry to its mouth more material than it otherwise would do.

As to the islands helow Grand island, I conclude from the evidence in this case, that at present they cannot he reclaimed by any practical means. Of course, the quantity of sediment in the river makes the problem more difficult and the means more expensive if they are to he reclaimed; but it would seem evident that this cannot be done at any reasonable cost until they are still further built up hy the operation of natural causes.

SACRAMENTO CITY.

I am compelled, hy the weight of the evidence in the case, to find against the plaintiff in the charge that the prosecution of its industry hy the defendant, with similar operations hy others, has impaired, or to a material extent is likely to impair, the sewerage of Sacramento, or injuriously affect the sanitary condition of the city.

The sewers of the city are about seven feet above tide water. The drainage was never into the Sacramento river, and perhaps could not rightfully he there. It does not appear that the city has been deprived of any outlets for its sewerage hy dehris, nor do I see that the drainage has heen interfered with, except during the very highest floods, which may be expected about once in eight years. The interference, at all events, is quite inconsiderable.

It is said that the soil-water is raised in the city hy sipage, so that cesspools are emptied of their contents. It is natural to think that raising the water level in the river will necessarily raise the level of soil-water in the vicinity. That it does so, to some extent, I cannot douht.

The drainage canal from Sacramento to Snodgrass slough, a distance of 25 miles, has a fall of about six ft. There can be no good drainage under such circumstances without pumping, and I do not see how the dehris has made matters worse in this respect.

The health of the city has heen steadily improving for the last 25 years and during all that time the city has ranked very high in regard to healthfulness with cities of equal population and similarly situated.

There has been manifested during late years, however, some tendency to a change in the character of the disease, from those of a purely malarial character to those of typho malarial character. This seems to he the usual course of disease in all newly settled countries, and, according to the testimony in the case, could not have been otherwise. The slight indigestion of a typhoid epidemic during one year is nothing more than is to be expected in any city.

I am entirely satisfied that the question whether the deposits of dehris in the vicinity of Sacramento has affected or will injuriously affect the health of the city is altogether too much a matter of theory to he the foundation of a judgment which shall deprive the defendant of the use of its property.

FOULING THE STREAMS.

The first mining in the river bars and channels discolored the waters to some extent as early as 1853, and the rivers have become more and more discolored hy sediment since. The early mining was in well-washed sand and gravel, which contained none of the red earth which has since so highly colored the water. The dry diggings were in red earth, hut were prospected only during high water, and therefore during the summer the rivers become reasonably clear.

As ditches were constructed, and mining in what are called surface diggings, as contra-distinguished from deep gravel mines, commenced, the water began to be colored as at present, red or yellow. This color is from sesquioxide of iron, which is not found in the deep gravel mines. The cementing material, however, contains protoxide salts of iron. Peroxidation of this commences upon its exposure to the air and water. This ferruginous clay is readily transported hy the water, and probahly is not so peroxidized as to discolor the water while heing transported.

Washing in the red gravel has greatly diminished since 1875; hut probahly the water still receives its deep color principally from surface washings.

There is evidence of considerable

FILLING IN SAN PABLO BAY,

Principally along the channels through the hays. Practically there is yet no impairment of navigation in this hay, and is not likely to be for many years to come. Suisun bay is rapidly filling with sediment, hut I conclude from the evidence that the volume of water passing through will always maintain channels sufficient for the purposes of navigation.

Conclusions of Law.

First.—That the plaintiff's cause of action and its right to the relief in this section demanded, is not harred hy all or either of the statutes of limitation pleaded hy the defendant in this case or otherwise.

Second.—That defendant has not acquired any right to the use of the hed of the American river, or of the Sacramento river, as places of deposit for its mining tailings, nor to choke or fill with such tailings the channels of said rivers in the valleys thereof, nor to flow or overflow the said lands situate along the bank thereof.

Third.—That the said acts of defendant constitute a public nuisance, in that they are an obstruction of the free use by a considerable number of the citizens of this State of their said lands, situate along the hanks of said rivers as aforesaid, so as to interfere with the comfortable enjoyment thereof, and in that they unlawfully obstruct the free passage and use in the customary manner of the said Sacramento river.

Fourth.—The mining customs, usages and regulations authorized hy the statutes of this State, or recognized hy the decisions of its courts, are local in their operation, and have not and are not intended to have any effect beyond a mining har, diggings or district in which they have heen adopted or recognized.

Fifth.—That the mining laws and mining customs or practices of the said Gold Run mining district, in which said defendant's mines are located, mentioned and referred to in the findings of fact herein, were not intended to and did not and cannot protect the defendant in the doing of the acts, matters and things complained of in this action.

Sixth.—That the plaintiff is entitled to a decree of this court restraining and enjoining the defendant, its superintendent, agents and employees, from discharging or dumping into said North Fork of the American river, or into Canyon creek, and also from suffering or causing to flow into said river any tailings, howlders, cobblestones, gravel, sand, clay, dehris or refuse matter perpetually, or until it shall he first shown, upon application made to this court for a modification of such decree, that dams shall have been huilt in said American river, which will prevent the heavier portion of said material, including the coarser sands, from coming helow Alder creek, or until some other means equally efficacious shall be adopted to impound said dehris, and which, in the opinion of the court, upon such application, will certainly prevent sand, and all heavier material than sand, from being carried hy the water helow Alder creek.

J. TEMPLE,
Superior Judge, presiding.

June 12, 1882.

The Opinion.

The People of the State of California, plaintiff, vs. The Gold Run Ditch and Mining Company, defendant.

This action is brought to restrain the defendant from dumping his tailings into the North Fork of the American river. It is charged that these tailings, heing washed down hy the current, are deposited in and fill up the channel of the American river helow Alder creek, as well as the Sacramento, impairing the navigation, increasing the liability of both to overflow, and making each overflow more destructive, causing deposits upon the farming lands, thereby rendering them unproductive, raising the soil water, which also tends to unproductiveness, and producing malarial and other diseases among the inhabitants of the valley. It is substantially found that much of the tailings come down the streams, filling up the rivers, and producing most of the evils charged. Navigation has heen obstructed, much valuable land covered with sand, and that the continuation of the practice will probably he productive of still greater damage.

The finding may be considered for the defendant, however, upon the charge that the debris adds materially to the malarial influences, or have obstructed, or will obstruct, the sewers of Sacramento, or have injuriously affected the sanitary condition of that city. It is found that mining pollutes the water of the rivers with mud, rendering them less suitable for domestic purposes. And that numerous other persons engaged in the same pursuit contribute dehris to the same streams, hut for which contributions the river would be able to maintain their channels without serious obstruction, notwithstanding the detritus from the mine of defendant.

The case is quite unusual in some respects, and I have departed from the customary findings hy adding a general finding in which are stated some conclusions in a mode less formal, and some deductions from the evidence, hoping that the special findings will be sufficient to sustain the judgment, and that the general conclusions may aid the appellate court in a review of the case.

The decision has been more or less delayed hy other official work, and somewhat hy failure to receive in time the promised briefs, and I especially regret that counsel for the defense have not complied with my repeated request that each party would suggest the points upon which special findings were required. There is no possible utility in an elaborate argument on my part in support of the conclusions to which I have arrived; but, in fairness to counsel, I will briefly state some of the conclusions.

Tha defeose — which may be deeignated hy the terms statnte of limitations, prescription, dedication and way of necessity—may he passed with tha remark that obvioosly tha plea indioated hy each term or phrase cannot be a defeose in this case. Indeed, it appeared to me on the argnment neithor wos really relied upon, hut wera all nsed as a convenient means of illnetrating and enforcing a more plausible proposition, which may ho briefly stated as follows:

Tha onstoms, nsages and practioo of miners, whioh hava universally prevailed, and which have everywhere heen acquiesced in throughout the Stata ever since its organiz tion, have sanctioned this nse of tho navigable streams, and in connection with the recognition and approval of the Government, both State and national, for a long serios of years. Everyone knowing the practice, and no one objecting, has changed the common law npon this subject—or at least the equitable circumstances exiat which hind the conscieocea of both Governmants and which cannot he disregarded hy them. The equitable circnmstances alluded to are manifest and could hardly ho too stroogly stated. So great a calamity to ao many people as would result from a judgment in this case, were it to be a precedent, has prohably never been produced by any case in thie country. And the acts which are said to be wrongful have certainly heen tolerated so long without objection, if they have not been encouraged, that no shadow of hlame can possibly attach to those who have invested their money in it. If the qnestion were in a legislative hody, whether soma law which had permitted it, and under the sanction of which it had grown into importance, should he repealed, the suggestion would he irresistible. So it would in an action, perhaps, where it involved only the proprietary rights of the Government, or any interest of the Government, simply considered in its corporate capacity. Such were the facts in the cases cited for the defense.

But there can he no estoppel which shall prevent the State from exercising its general governmental powers in providing for good government; and certainly no equities can grow up in favor of one set of citizens as against others by the fact that illegal acts have heen long tolerated or that they are convenient in the preservation of a great industry the importance of whioh has heen repeatedly recognized. Here are many citizens complaining that their rights are heing violated, their property and their health threatened, and their common highway over navigahle waters obstructed hy the illegal acts of the defendant and others. To constitnte equitahle circumstances which can hind the Court in such a case they would need to he such as would legalize the acts claimed to he wrongful. Has, then, the national or State Governments licensed the defendant to make this nse of the navigahle streams, or in any way legalized the practice? Has the common law in that respect heen modified, as claimed hy the defendants? It is of couree not claimed that any action on the part of the Federal Government has changed the common law of this State. That is not within the authority of that Government. So are the authorities, and they were not needed in eo manifest a case. And it would seem equally clear that the United States has not licensed this nse of the rivers, and that it cannot do so, nor can it dedicate them to the use of the miners.

For the purposes of this inquiry it may be conceded that it has licensed the miners to enter upon the public land, to prospect and dig for gold; to appropriate the waters from the non-navigahle streams and conduct them for long distances, discharging them again—perhaps into streams from whioh they were not taken—corrupted and snrcharged with mining dahris. Washing the hills down into canyons and tha channels of the mountain streams. To make every canyon or gulch a common way for the tailings of all. That it has finally sold to them the mines with tha right to extract from them tha gold, and with the foll knowledge of the mode of working them, and with full knowledge that tho practice of miners in this respect was nniversal and under claim of right.

These propositions are not admitted on the part of the plaiotiff, but do any or all of them imply the consent of the Government to the deposit of tailiogs in the navigahle rivers?

Obviously, all these are the acts of a land owner. The Government has suffered this occupation and use of the public land. They can imply nothiog more, for the United States has no further rights in the matter, or powar over it. It was stated on tha argument, that Congress may, and perhaps has, devoted these navigable waters to this industry, under the power to regulata commerce. But evidently this cannot be so. The reason given was that gold facilitates commerce. The products of most industries promote commerce. Nothing facilitates it more than good government and security for property. Under such a construction, the power to regulate commerce with foreign countries and among the States would be the Aaron's rod to swallow all others. The reserved powers of tha States would only he exercised by sufferance. Mining is not a branch of commeroa, and certainly not of commerce with foreign nations or among tha States. But, if Congress did possess the power, the intention to permit the destruction of navigahle waters, so extensive and important, could not he inferred from any douhtful acts. Such a policy is opposed to the practice of all civilized people, and to our own tradhions especially. It is manifest from a simple statement of the proposition, that no such result was or could have been anticipated. Then the evil was not evident immediately. There does not seem to have heen any material injury until 1864, and even yet it is stoutly denied that the tailings materially injure navigation. The suggestion as to the intention to he inferred from the acts committed and industry encouraged apply with equal force to the claim that the State has licensed this use of the navigahle waters.

The Legislature and the courts have recognized the fact that the United States has licensed this extraordinary intrusion upon the public land and the rights asserted hy the settlers. Beyond this it has provided for their governmental wants as it has for other communities, and has done so, in part, by recognizing the rules and regulations adopted hy themselves when they practically had no government, save such as sprang spontaneously from the instinct for order and genius for organization which seems part of the natnre of people accustomed to self-government.

These were principally to settle their possessory rights to the land, and to subject it to what was then a novel use under our system. As has been said, it, hy wise judicial decisions, has molded them into a comprehensive system of common law, embracing not only mining law, hut also regulating the nse of water for mining purposes. Perhaps these customs and the practices of miners have heen the chief agency in modifying the law of riparian rights—if it has heen modified—as not suited to our climate and civilization. In all this, however, there is no rule or custom which can justify the olaim that hy common consent the navigable waters were snhjected to the nse of mining, so as to allow tailings to he deposited in them to the injury of navigation. The only thing that can he said is that, in the prosecution of a great indnstry hy a great many people, the practice of dumping into the mountain affluents of these streams has been followed for a long time, and that a great deal of money hse heen invested in the business, in the full helief, justified, to some extent, hy long toleration, that it would he permitted to continne, and that extensive villages have grown up dependent upon it. The rules and customs of miners and their practices, or the fact that they have become part of the common law, outside and apart from this long tolerated practice of dumping into these navigahle streams, cannot affect this qnestion.

The practice of dumping diractly into the navigahle watere has never existed, and it is difficnlt to see how long submission to the consequent injury differs in any respect from any other case where a community has tolerated a nuisance for a long time. In other words the defence is an ingenious attempt to evade the rnle. *Nullum tempus occurrit regi*, the evideoce of acquiescence is long endorance.

The mischief, however, as has been said, was not immediately apparent. An action could not have been maintained, for lack of evideoce of injury, for many years. A public wrong is not made legal, and certainly acquires no vested right to he perpetuated from long forhearance. There being no change in the common law, the case would he remitted to the ordinary defense of tha Statute of Limitations.

I have concluded to so find that when the heaviar debris is completely impounded mining may be resumed, virtually refusing to hold that the plaintiff may enjoin such operations as only corrupt the water with mud and render it less suitable for domestic and other uses. Perhaps I am somewhat moved to this hy the consideration that mining can never be prosecuted at all. It will probably he impracticable to impound the lighter portion of the sediment. I confess I shrink from a consequence so far reaching. It seems to be a conceded fact that this is not materially injurious either to navigation or the riparian lands. Counsel denied that there was any intention to assail the prosecution of drift, seam or quartz mining. There was no material injury from that source. The sediment from such mines is of the same character as the material which cannot he wholly impounded. Perhaps this will not materially add to the permitted evil.

The authority of the Attorney-General to bring the action in the name of the people, has been called in question, and may become a serious question in the Supreme Court. Practically, it was made only on the final argument. Under the circumstances, I do not douht the propriety of my referring that matter to the Supreme Court. If the point were sustained and the case dismissed, in the event of a reversal, a new trial would he necessary before the vital questions involved in the controversy could he presented to the appellate tribunal. There have heen many cases in that Court brought hy the Attorney-General, on the presumption that such power exists. No question of authority was made. A trial court, under such circumstances, may well follow the practice until a precedent is formed.

J. Temple, Superior Judge.

June 12, 1882.

The Decree.

In the Superior Court of Sacramento county, State of California. The People of the State of California, plaintiff, va. The Gold Run Ditch and Mining Company, defendant.

This cause having heen duly called for trial upon the complaint, and answer, and both parties appearing and waiving a jury trial, the said cause was duly tried before court without a jury, and the court having heard the evidence and the argument of counsel, has duly signed findings of fact and conclusion of law therefrom, which said findings are now duly filed in this court.

Now, therefore, hy reason of the premises and of the law, it is considered by tha court, and it is ordered, adjudged and decreed:

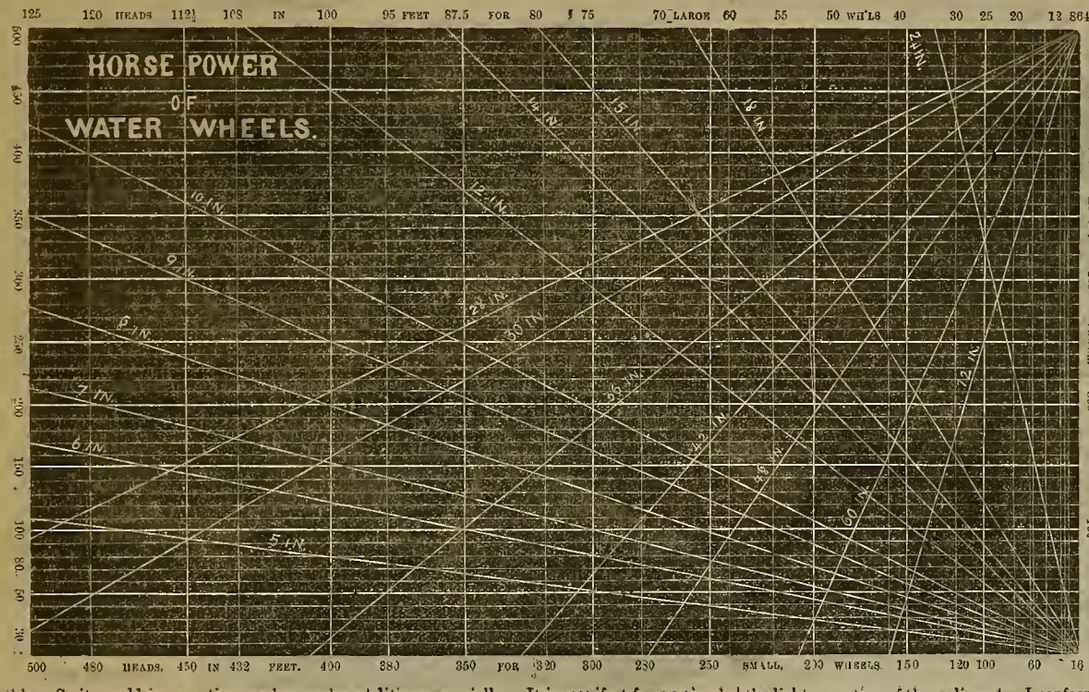
That said defeodant, and all the officers, superintendents, foremen, agents and employees thereof, he perpetually enjoined and restrained from discharging or dumping into the North Fork of the American river, or into any stream tributory thereto, and especially into Canyon creek, any howlders, cobblestones, gravel or sand from the mines; also from causing any such material to flow or to be washed into said river from its said mines or tracts of mineral land.

Subject, nevertheless, to this, that said defendants may at any time, as it shall he advised, apply to this court to have this decree and restraining order modified or vacated and set aside. And whenever, upon such showing, it shall appear that efficient means have been provided to impound, detain and hold back anch tailings at any point on said Americao river above Alder creek, and that such means are sufficient to detain all bowlders, cobblestones, gravel and the heavier sand, then said defendant shall he entitled to have said decree vacated and set aside. It is further adjudged and decreed that plaintiff recover costs herein, taxed at ——.

J. Temple,
Soperior Judge, presiding.

June 12, 1882.

Scale of Horse Powers.



In the scale, shown on this page, which we take from Prescott, Scott & Co.'s circular, the lines of horse power are parallel and equi-distant. The lines of heads in feet are parallel and are set at distances from 0 proportional to the cnhe of the square root of the head in feet. The lines of diameters are drawn diagonally, and interseot the lines of heads in feet proportionally to the squares of the diameters.

In order that the diagonal lines should not he too crowded, those representing diameters from five inches up to 24 inches have been drawn from one corner, while those from 28 inchea up to 72 inches have heen drawn from the adjacent corner on the line of 0 feet head. The lines of horse power are nnmhered increasing from the origin of the lines of diameters which they are designed to measure.

To illustrate the method of using the ecale, take two examples. First, a 39-inch wheel nnder 70-ft. head. Following the line marked 70 in the margin of heads in feet for large wheels, to its intersection with the diagonal of 30 inchee diameter and then going back from the opposite side of the diagonal in the line of horse power, the figure in the margin will indicato 200 horse power.

Second, a wheel of 14 inches diameter under 300-ft. head. Taking the line marked 300 in the margin, heads in feet for amall wheels, to its intersection with the diagonal of 15 inches diameter and following the horse power line from the same side of the diameter line to the margin it will he found to indicate 450-horse power.

The Sackett School. — This well-known Oakland school for hoys and yonng men closed a very prosperous year, by public exercises, on May 19th. The graduates delivered very creditable orations. The principal, Mr. Sackett, then distributed the medals and prizes. For the Harmon gold medal, for excellence in English, decided hy the standing in grammar and composition, George L King and Fred Stanford were so nearly equal that it was impossible to decide which one was entitled to it. The two hoys drew lots, and the medal was drawn hy Stanford. Other prizes were distributed as follows: Second Harmon prize, Albert C. Phillips; Hathaway medal, for excellence in classics, Harry Wells Sabin; Blasdel gold medal, for excellence in elocution, J. H. Hill; McFarland prize, for excellent conduct in the primary department, Harry Ainsworth; Taylor prize, for excellence in writing, Fred T. Griffith; Hainss' prize, for gentlemanly conduct in the family, James A. Crawford; spelling prize, Grant Marden. Rev. Dr. McLean presented diplomas to the three graduates—Harry Wells Sabin, of San Francisco, Fred Wilson Potts, of Los Angeles, and George Hathaway Bixby, of Los Angeles—making a few well-timed remarks. The Sackett school has now on its lists 92 pupils, and is moving to the front in all that marks thorough training.

The Electro-Magnet. — The question—"What constitutes the strength of the electro-magnet"—is answered through the *Scientific American*, as follows: The magnetic strength of an electro-magnet depends upon the eize of the iron core, the number of turns of wire surrounding it, and the strength of current charging the wire of this helix. In practice these helices are seldom wonnd to a diameter exceeding three times the diameter of the core, as what is thereby gained in magnetic moment is more than lost in increased resistance of helix circuit.

A Notable Steel Chain. — There has lately been made at Hull, England, a chain of Siemens steel; 180 yards long, containing more than 3,200 links, held together hy about 850 steel pins. It is intended for lifting purposes, has an estimated strength of 60 tons, and is thought to be the largest chain of its kind ever made.

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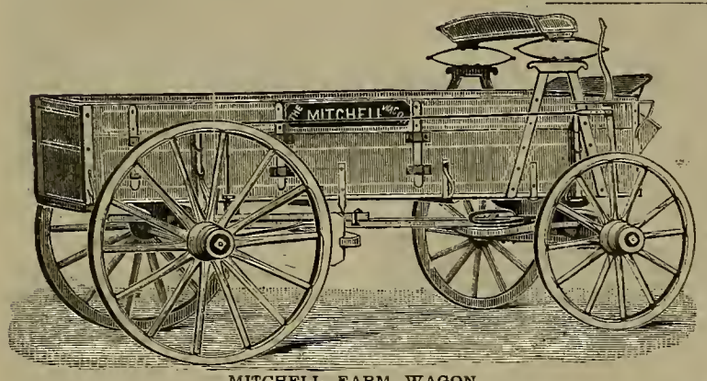

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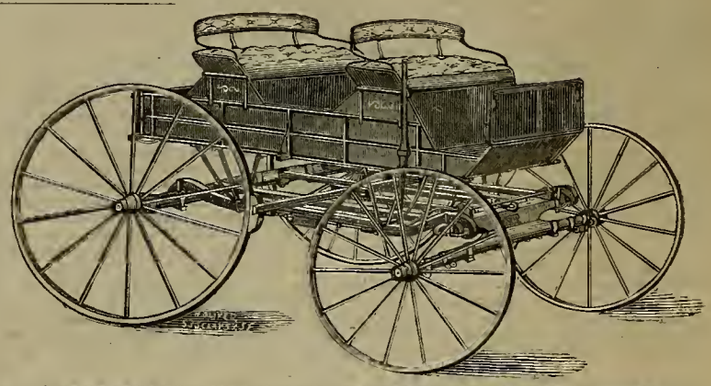

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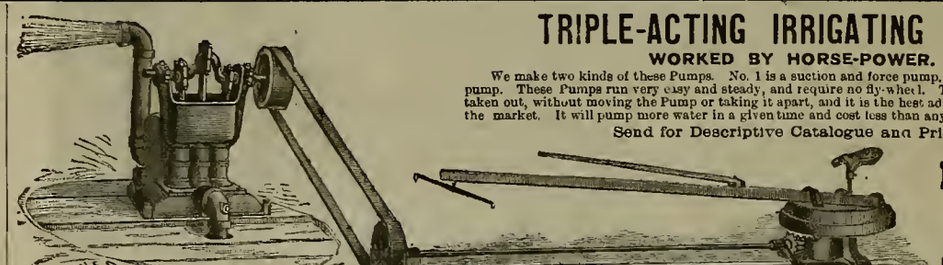

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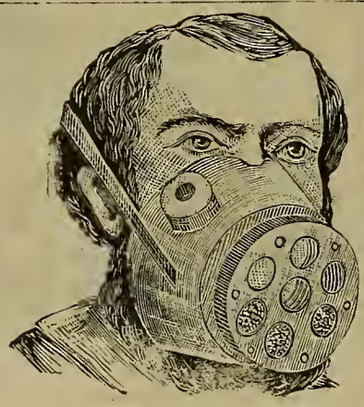

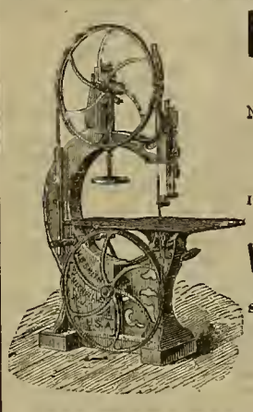

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Mechanics Mills, corner Mission and Fremont street.

Drainage of the Hydraulic Mining Districts.

We give on this page a map of the lower portions of the Sacramento and Sao Joaquin rivers, showing the tributary streams draining the hydraulic mining districts of California. This map is a *fac simile* of the large one, which accompanies the report of Col. G. H. Mendell, U. S. Engineers. The map will be useful to all interested in the hydraulic-mining industry, showing, as it does, the details of the water-courses of that portion of the State.

The navigable waters of California affected by hydraulic mining consist of the bays of Suisun, San Pablo, and San Francisco, forming the great estuary of California; and of the rivers Sacramento, San Joaquin, and the Feather.

The Sacramento river rises in the north and flows in a southerly direction through the great valley flanked on the east by the Sierra Nevada, and on the west by the Coast range. The Feather is a tributary of the Sacramento.

The San Joaquin has its source in the south and flows in a northwesterly direction through the valley, uniting with the Sacramento at the upper or eastern end of Suisun bay. The strait of Carquinez connects Suisun bay with San Pablo bay, which opens into San Francisco bay, and, taken as a whole, these separate bays and rivers afford a continuous channel, connecting with the Pacific ocean through Golden Gate. The auriferous drift deposits which are worked by the hydraulic process lie on the western slope of the Sierra, in a belt 40 or 50 miles wide, extending from the plains or edge of the valley to altitudes of 4,000 or 5,000 ft.

The length of this deposit, measured in a northwesterly direction, parallel to the crest of the Sierra, is about 150 miles, and extends from the Merced river on the south to Chico creek in the north, with some exceptionally placed deposits lying both north and south of these limits.

It may be remarked that in addition there are, on the Klamath and Trinity, one of its branches, quite important places, which are now worked. The detritus is lodged in the rivers, which are neither navigable or tributaries of navigable rivers, so that this separate mining district is not thought to come within the limits of this investigation. The Klamath empties into the Pacific ocean a few miles south of the northern boundry of California.

The tributaries of the San Joaquin, coming from the Sierra Nevada, and affected by mining, either past or present, are the Merced, the Tuolumne, the Stanislaus, the Calaveras, the Mokelumne, and the Cosumnes. Each of these rivers has small tributaries, which, for the sake of clearness, need not be mentioned by name, but which are to be understood as being included in the designation of the larger tributaries.

The Feather and American are the principal tributaries of the Sacramento, which drain the mining districts. The Feather is a large river, draining 3,400 square miles, and includes as its tributaries the Yuba, with its three forks, and the Bear, which rivers are noted as the seat of the principal hydraulic mining operations of California. The Sacramento and San Joaquin rivers, near their mouths, flow through a delta of considerable extent, the surface of which is below the level of flood waters. The connecting channels surround a number of islands. The soil is extremely fertile, and great efforts have been made, thus far with limited success, to reclaim the land. Insecurity in foundations and the absence of a proper material for making levees, have been the chief difficulties in the way of complete reclamation.

Several streams, the principal of which is Auburn ravine, carrying mining detritus and natural tributaries of the Sacramento river, do not reach it directly, but discharge into the basin between the American and Feather. The drainage of the Spring Valley mine, on the water of Butte creek, does not reach the Sacramento directly.

The lower portions of the Cosumnes, Mokelumne and Calaveras—all tributaries of the San Joaquin—lie in the delta lands, which receive a part of the mining detritus of these streams, and to this extent relieve the San Joaquin from injury.

The Mineral Springs of California.

On other pages of this issue we give the most complete review of the mineral springs of California ever attempted by a newspaper. The material is drawn from a careful monograph on the subject by F. W. Hatch, M. D., permanent Secretary of the State Board of Health. This document, being of a technical character and circulated mainly among members of the medical profession, is not attainable by the mass of readers whom its researches would interest and benefit. For this reason, we have attempted the publication in popular form, and trust that the result will be to the advantage of our readers everywhere.

The mineral springs of our State are one of the resources of California which are too often overlooked. Not only do they dispense their healing and restoring virtues to our citizens whom the cares and toils of life have enervated, but they bring to us a host of tourists and health seekers from all parts of the world. The number at present visiting our springs and health resorts is hardly a tithe of the throng who will come hither when our springs and their healing powers shall be better known. It is natural, in view of their short history, that knowledge of them should be somewhat fragmentary and incomplete. Concerning this point, Dr. Hatch says: "Practically, the history of our mineral waters, as derived from an actual knowledge of their effects upon disease—intelligent observation of the results of treatment with those afflicted with diseases properly diagnosticated—would, if it could always be secured, furnish us a much more reliable guide in forming just conclusions of their value in any given case than the theoretical reasonings of the chemist. Such accurate information, in the early history of medicinal springs, is not always to be obtained; popular rumors, or even the reports of individuals upon their own experience—of cures effected in their own persons—are to be received with much suspicion, on account of probable diagnostic errors and the misinterpretation of symptoms. Fortunately, we have the experience derived from the mineral springs of Europe as a guide, which have become so well known as curative agents in various diseases, that we are able, with a reasonable degree of accuracy, to associate their effect with certain known combinations of ingredients; and it is true that these effects in general correspond with what the materia medica teaches should be expected from the results of analysis. The same is true of many well-known springs of other States in this country—notably, those of Virginia. The mineral waters of California bear a marked resemblance in their chemical composition with some of those of Europe and Virginia, and from a knowledge of the latter we may draw rational conclusions as to the remedial virtues of the former."

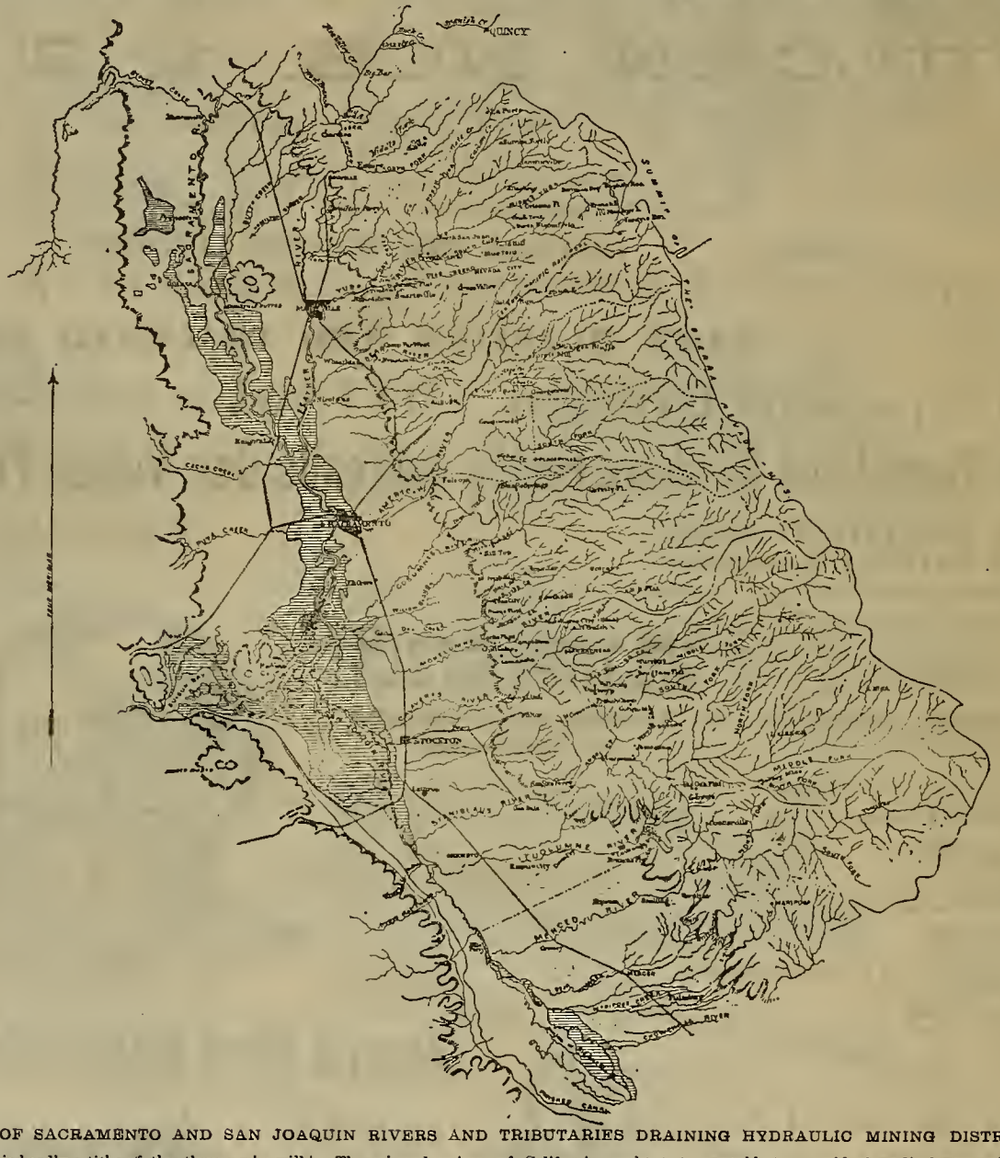
The analysis of the chemist is of great value as supplying data by which our springs can be compared with waters which have secured wide fame because of the cures they have effected and the co-relative benefits conferred. It would seem eminently fitting that the State should undertake work of this kind with reference to our mineral springs, because the effort should be systematic and comprehensive, and its results should be lifted above all suspicion of individual interest in the facts set forth. Sets of analyses procured by the owners of the properties will always be open to suspicion, even if they were really faultless. The recommendations of Dr. Hatch in this respect are worthy of general consideration.

The mineral springs of California ought to assume their legitimate place as instruments, either of evil or of good. They deserve investigation, and the public should be instructed as to their use. This can be done only when their constituents are accurately determined. When this is accomplished, those that possess a real value will continue to command confidence; while the worthless may be exposed.

This much, it is believed, is demanded in the interest of the public. The expenditure of even a small sum in this direction will redound greatly to the benefit of the State, and assist in developing one of its prominent and really valuable interests. It is not pretended that an analysis alone can be an infallible indication of the therapeutical value of mineral waters; experience affords the only positive evidence. Yet chemical analyses, by revealing to the physician the presence of ingredients with whose special effects he is familiar, will enable him to form correct general views of the action of the water, and serve to prevent, as remarked by a distinguished author upon the subject, "The incessant mistakes and mischief which medical men commit in sending their patients, haphazard, to drink mineral waters which are often unadapted to their cases." Analysis—a knowledge of the mineral combinations existing in these waters—added to the experience we are every year acquiring in their use, will give them a practical value, and establish their reputation upon a basis which, without it, they can never attain.

It may be said that the mineral springs are private property, and should be developed by private enterprise. This is true. But the action of individuals is uncertain, and while we are waiting for its determinations the interests of the public suffer. There is, besides, no guarantee afforded of the reliability of the analyses thus procured. They may be reliable, or they may not. Doubtless a considerable number of those already made have been done by competent hands, but of some we have reason to believe that the representations made are simply conjectural; nor can we be sure that due care will be exercised in this regard in the future. An analysis, unless trustworthy, is worse than useless. It misleads those who should, least of all, be the subjects of deception.

We trust the suggestions of the secretary of the State Board of Health will be productive, and that the important material endowment of the State in her mineral springs may ere long develop, and their values set forth in a form acceptable to a world of medical men and their patients.



MAP OF SACRAMENTO AND SAN JOAQUIN RIVERS AND TRIBUTARIES DRAINING HYDRAULIC MINING DISTRICTS.

SORTING RICH ORE.—Mr. Johnson, who has for some months been working the Indiana mine, has invented an original and novel racket for sorting rich ore. Some of the rock is of very high grade in silver, necessitating careful work. However, he says of his arrangement, that "It is made for a lazy man like me, and for a good many more who like to sit down to work. It is so arranged that when filled it screens the ore as it is being moved forward, and only handling it once. A man can make as many different grades of ore as he likes. The machine consists of a few boards, a piece of screen about two feet square, one joint of stove-pipe, one coal-oil can, a few nails and a piece of old rock-breaker, a few boxes and a pillow; yes, a pillow! I suppose you know what it is used for—it is much needed to perform the work; for a box is rather hard, even on the soft side of it. All the power required to work the machine is the muscle of one strong man, with plenty of patience and a willing mind to work."—*Inyo Independent.*

THE Washington monument has reached a hight of 270 ft., 20 ft. of stone having been added since May 1st.

BULLION FROM TAILINGS.—At intervals during the winter and spring, Mr. J. H. Holt, a man without a superior in working Inyo county ores, has been running the Rex Montis mill on tailings. Much of them were scattered along the creek far below the mill, having for years past been allowed to run into the stream and be washed away, as of too little value to bother about. By re-grinding them, some portions two or three times, he has secured nearly $2,500 in bullion, as shown by the sum of numerous express shipments made during the period named. This re-working is still being carried on, and quite as profitably as ever.—*Inyo Independent.*

THE married men employed by the Day mine at Royal City, who came there from two to four months ago, are now sending after their families, who have been residing in different camps on this coast, and some in the East. Really, this does not look bad for the future of Royal City.—*Pioche Record.*

INTERESTING DISCOVERY.—It is said that an important and hitherto unknown treatise by Copernicus, on the movements of the celestial bodies, has been discovered in the archives of the Astronomical Observatory at Stockholm.

"THE $1,000 CHALLENGE"

Ore Feeder for Quartz Mills.

OVER 800 ARE NOW IN USE, GIVING ENTIRE SATISFACTION.

Awarded First Premium at the Tenth and Twelfth Industrial Fairs of the Mechanics' Institute.

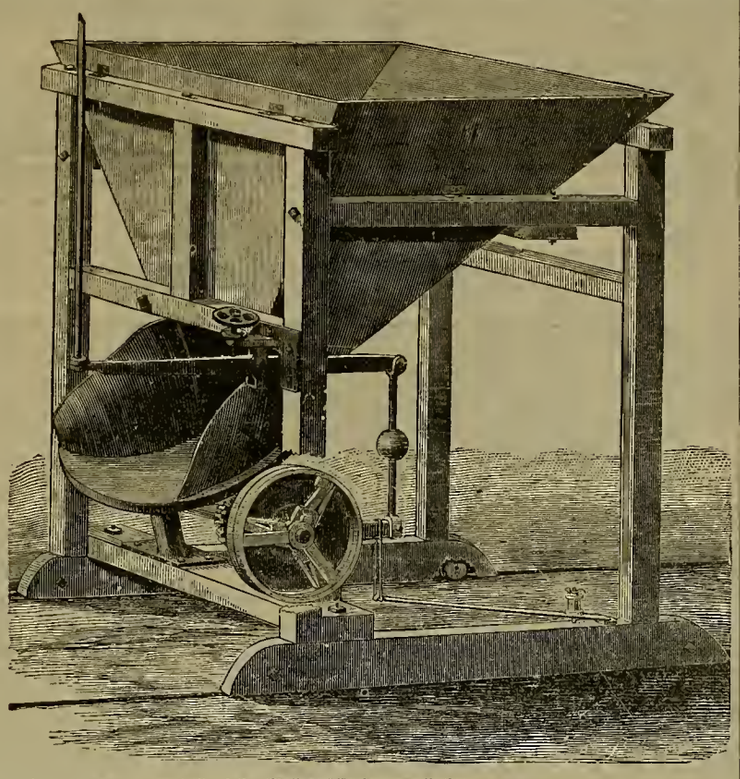
Twenty Per Cent. More Ore Crushed with Fifteen Per Cent. Less Wear of Iron than by Hand Feeding.

The accompanying cut illustrates the recently introduced Grip, and also the Spring Attachment, which replaces the Weight heretofore used, and which are obvious improvements.

It is now fully demonstrated, after careful and long continued experimentation and practical use, that the plan upon which a perfect Ore Feeder must be constructed is that of a carrier, and not that of a shaking-table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Jerky or spasmodic contrivances will not answer the purpose for wet or sticky ores.

The Challenge Ore Feeders are now in Use in the following Mills, besides many others

Soulsby	20 Stamp	Tuolumne county, Cal.	
Sheep-Ranch	20 "	Calaveras	" "
Mahoney	40 "	Amador	" "
Zelle	40 "	"	" "
Placerville	40 "	El Dorado	" "
Gross	80 "	"	" "
Julian	20 "	Placer	" "
St. Patrick	15 "	"	" "
Providence	20 "	Nevada	" "
Omaha	10 "	"	" "
Green Mountain	60 "	Plumas	" "
Plumas-Eureka	60 "	"	" "
Bulwer-Standard	30 "	Bodie Dis., Mono,	
Standard	20 "	" "	" "
Noonday	30 "	" "	" "
Bodie	10 "	" "	" "
Christy	5 "	Uintah Co., Utah.	
Ontario	40 "	Parley's Park,	"
Contention	20 "	Tombstone Dis, Arizona	
Grand Central	20 "	"	"
Harshaw	20 "	Patagonia,	"
Sunshine	20 "	Idaho Springs, Col.	
Homestake	20 "	Black Hills, Dakota.	
Father De Smet	8 "	"	"
Hidden Treasure	40 "	"	"



Superiority of the "Challenge" Ore Feeder Demonstrated!

At the "Christy" Mill, Uintah County, Utah, the "Eclipse" Feeders, (conceived by E. Coleman) were introduced, but not carrying a regular supply of ore for the crushing capacity of the stamps, were replaced by the "Challenge," which are now running and the stamps crushing forty (40) per cent. more ore than was done by the "Eclipse."

The "Harshaw" or "Hermosa" Mill, of Patagonia District, Arizona, was also originally fitted with "Eclipse" Feeders, but after a few weeks trial they were pronounced inadequate to the work, discarded, and the "Challenge" adopted.

The "Silver King," Mill of Arizona, also removed the "Eclipse" Feeders to give place to the "Challenge."

The "Sola" Mill, of Brown's Valley, Yuba County, Cal., was fitted with "Victor" Feeders, manufactured by E. T. Steen, but proving insufficient, the "Challenge" Feeders were substituted.

Four of the "Victor" Feeders, manufactured by E. T. Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.

These cases are simply cited from among many similar instances, in proof of the vast superiority of the "Challenge" Feeders over all others.

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Machine Works, 49 and 51 Fremont Street, San Francisco.

Manufacturer of Quartz Saw Mill and General Machinery. Also Agent for BAKER ROTARY PRESSURE BLOWERS, and WILBRAHAM ROTARY PISTON PUMPS. P. BLAISDELL & CO.'S Machinists' Tools. HOT POLISHED SHAFTING from the Akron Iron Company, of Akron, Ohio.

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WORKS ORE WET OR DRY.

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By W. I. TUSTIN, Inventor and Patentee.

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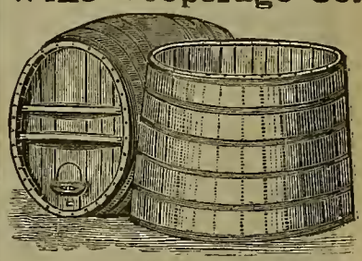

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BERKELEY, CAL.

A NEW BOARDING AND DAY SCHOOL, FOR YOUNG LADIES.

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The HARMON SEMINARY will receive girls of all ages; the instruction comprising Primary, Preparatory and Academic. Thorough course in the English branches. The Arts, Music and Modern Languages in charge of well known masters. Special course preparatory to the State University.

The HARMON SEMINARY will be first-class in all respects, and will combine the best educational advantages with home care, guidance and guardianship.

The first year will open August 3, 1882.

For prospectus and other information, address S. S. HARMON, Berkeley, Cal., Or. E. J. WICKSON, 414 Clay st., S. F.

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Takes first rank for thoroughness and ability of its teachers; also for home care.

Business, Classical, and English Departments.

Next Term commences July 17th.

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Carson and Colorado Railroad.

(NARROW-GAUGE.)

The Company announces the completion of its line March 1, 1882, to CANDELARIA, Columbus Mining District, Esmeralda Co., Nev., 158 miles from Mound House (Junction with Virginia and Truckee Railroad).

STAGE CONNECTIONS,

At Hawthorne with U. S. Stage Company's daily coaches for Aurora (26 m.); Bodie (37 m.); Lundy and Bridgeport.

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This is the direct and natural route for Passengers and Freight, to points in Southern Nevada, Mono and Inyo counties, California. The line, built with steel rails and redwood ties and equipped with new and first-class rolling stock, is penetrating new and most promising Mining Districts which are now attracting deserved attention throughout the country.

For information on through freight rates apply to H. M. YERINGTON, Gen'l Supt. D. A. BENDER, Gen'l Freight & Pass. Agent, Carson, Nev.

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Orders for Mining and Scientific Books in general will be supplied through this office at published rates.

IMPORTANT SEMI-TROPIC COLONY ENTERPRISE.

The Fairest and Best of Colonies.

THE REDLANDS,

In San Bernardino County, California.

Superior Soil, Climate and Irrigating Improvements.

The following information concerning one of the best-reputed and promising colony enterprises in southern California, is from the Riverside *Press*, of San Bernardino county, April 1, 1882:

A Model Settlement.

No place in California has sprung into public notice so rapidly and gained so deserved a reputation in so short a time as has the new tract of Redlands.

This tract is located between Old San Bernardino and Crafton on the south side of Mill Creek ditch and comprises 2 500 acres of as choice fruit lands as can he found in the State. The land is of a reddish clayey loam, not clayey enough to work hard, having sufficient admixture of sand to hold moisture and give the best results when planted to orchard or vineyard. The red lands of the State are everywhere celebrated as being superior for tree and vine.

The tract slopes to the northwest and commands one of the grandest views to he found in the State. To the north and northwest lies stretched out, several hundred feet below, the San Bernardino valley, with the towns of San Bernardino and Colton plainly in view, while, looking to the westward at night, the headlights of the Eastern-bound trains can he distinctly seen for 40 miles. Beyond the San Bernardino valley to the northwest, and stretching around to the northeast, the chain of mountains tower 9,000 ft. above the sea level, culminating in Mount San Bernardino, 11,000 ft. high, and Grayback, 11,550 ft. high, both of which stand up boldly from the Redlands point of view, and whose tops are covered with snow more than half of each year. Around to the left of the picture are the Cucamonga peaks, 40 miles distant, which complete the semi-circular mountain chain that makes such a beautiful background to the landscape. For mountain and valley scenery no more beautiful location can be found in the State than Redlands, outside of Yosemite valley.

Redlands is located 10 miles from the county seat, the same distance from Colton, and 15 miles from Riverside. The track of the Southern Pacific railroad runs within two miles of the Redlands tract, and at an early day a depot will he established for the accommodation of Redlands, Lugonia, Crafton and Old San Bernardino.

The Redlands tract is laid off hy running avenues from northeast to southwest, one-quarter of a mile apart and cross streets at right angles to those avenues every half mile, thus cutting the tract into blocks, each of which contains 80 acres. The avenues are each 100 ft. wide, and are being graded and set to shade trees, there being a row of trees down the center of each avenue and a row on either side, making a beautiful double drive with shade trees on either side. Between the front line of the block and the center line of shade trees is a sidewalk 12 ft. wide. The cross streets are 60 ft. wide, and are also being planted in shade trees on either side. The streets furnish a single drive with sidewalks on either side.

Although the first work done on the tract hy settlers could not be commenced till about the 1st of January, 1882, there are at the present time some 10 or 12 houses erected and in process of erection, with several to commence work soon. A number of tracts, in addition to those on which houses are being built, are being plowed up and planted to orchard and vineyard.

The lateness in the season when the land was bought by purchasers, prevented many from getting their land set out to trees or vines this year, but all who have purchased are making arrangements to plant extensively next winter and spring.

Town Plat.

Near the center of the tract is a town plat, consisting of 140 acres, cut up into lots ranging from an ordinary business lot to two and a half and five acre residence lots. Within this town plat, at the crossing of Palm and Center avenues, is a circular public park, with a fountain in the center. This park will he improved hy the proprietors of the tract. Above the town plat will be constructed a small reservoir, from which iron pipes will he laid to supply the town with water under pressure.

The Water System.

Is one of the most perfect in the State. The water supply comes partially from the South Fork ditch of the Santa Ana river and partially from private water developments in the Santa Ana canyon and other localities. The waters are to he conducted to a large reservoir, located in a canyon adjoining the tract, and distributed from this reservoir hy means of cement pipes. These pipes will he so laid as to carry the water without loss to the highest point on each ten-acre lot. The basis of water supply is one inch of water, statute measurement, to each eight acres of land. This is ample, and up to the best irrigated tracts in the State.

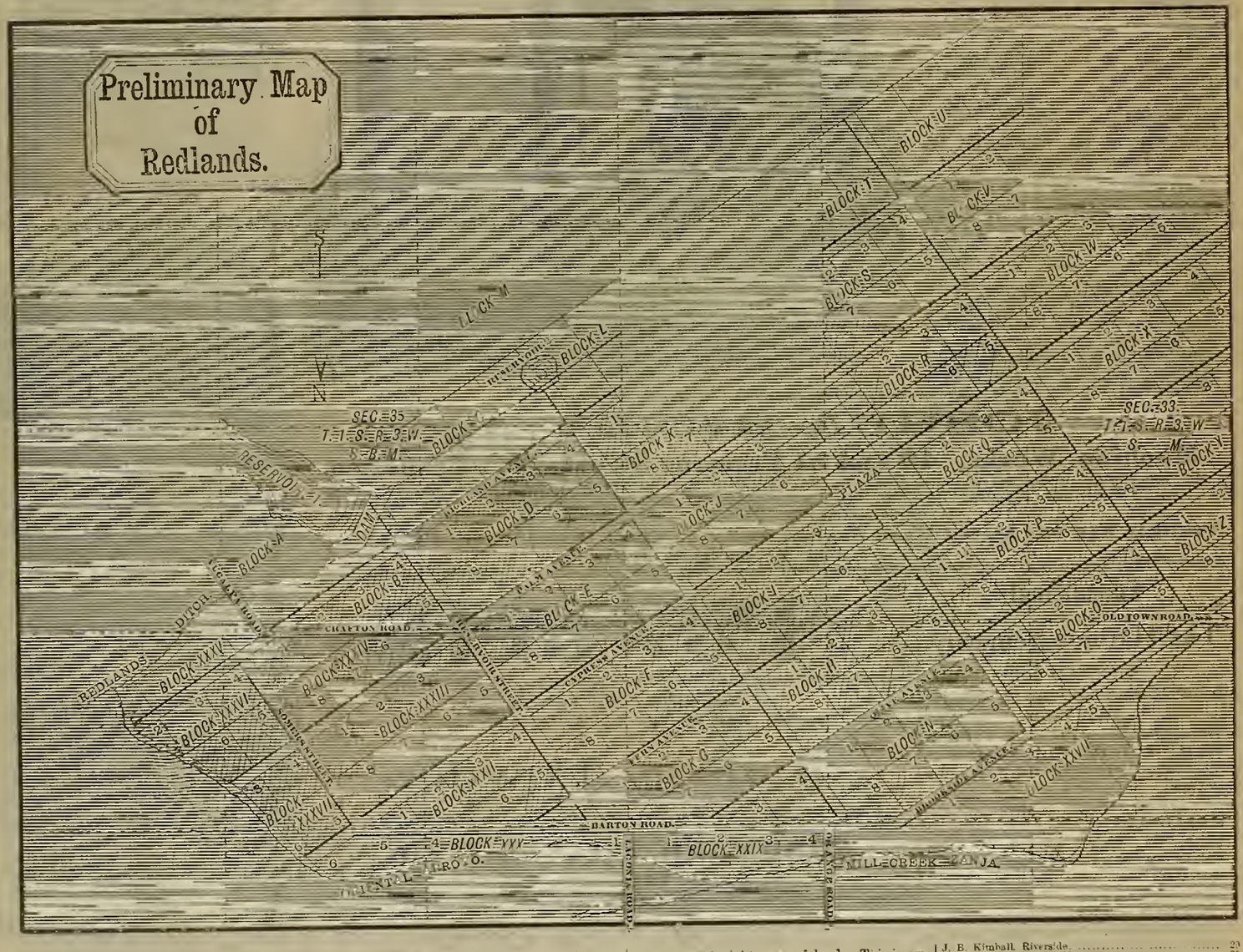
Work on the water system is being pushed as rapidly as men and money can do the work. The dam to the reservoir, which is ultimately to he 60 and perhaps 80 ft. high, is now about half done; the iron discharge pipes and watergates are in position, and nearly four miles of the largest distributing pipes are already manufactured, and most of this is laid. This portion of the work embraces the 8, 10, 12, and 14-inch pipes—the heaviest portion of the work. The smaller pipes, none of which will he less than four inches, will he made and laid as soon as the larger pipes are completed.

The orange, lemon, apricot, peach and raisin grape, will grow here to perfection.

Following is a list of the property owners at the present time. Those who have moved upon the tract are credited to Redlands, and the others to localities where they now reside:

Names.	Acres.
J. G. Cockshutt, Redlands	20
C. W. Kidder, Redlands	10
J. F. Welsh, Redlands	20
B. W. Brown, Redlands	10
Israel Beal, Redlands	10
C. E. Tuesdell, Redlands	20
R. B. Morton & Co., Redlands	30
C. A. Smith, Redlands	10
C. W. Smith, Redlands	10
Mrs. R. W. Brown, Redlands	10
Mrs. E. E. Seymour, Redlands	20
P. R. Brown, Redlands	20
A. G. Simms, Redlands	10
Simeon Cook, Redlands	20
J. E. Sinclair, Redlands	20
John Carroll, Redlands	10
George Cassady, Redlands	10
Orsen Van Leuven, Redlands	10
C. K. Dewell, Redlands	10
E. J. Waite, Redlands	2½
W. N. Mann, Riverside	50
A. S. White	20
L. M. Holt, Riverside	20
K. F. Overton Riverside	20
G. W. Boggs, Riverside	10
A. W. Boggs, Riverside	20
S. R. Weir, Riverside	10
J. S. Edwards, Riverside	10
Geo. Frost, Riverside	20
Mrs. V. V. Aumabel, Riverside	50
J. P. Greeves, Riverside	10
D. U. Findlay, Riverside	10
A. G. Saunders, Riverside	10
E. K. Henderson, Riverside	20
Rev. F. M. Colburn, Riverside	10
E. P. Moody, Riverside	10
T. B. Stephenson, Riverside	10
A. H. Averill, Riverside	10
J. S. Cover, Riverside	10
S. McCoy, Riverside	10
S. H. Averill, Riverside	10
B. F. Allen, Riverside	10
H. E. Allett, Riverside	10
H. E. Branch, Riverside	10
E. M. Westbrook, Riverside	10
J. B. Kimball, Riverside	20
N. H. Kingsley, Riverside	20
Hugh Marshall, Eureka Mills, Plumas county	20
T. B. Inch, Eureka Mills, Plumas county	20
J. Hosking, Eureka Mills, Plumas county	20
T. W. Ladd, Eureka Mills, Plumas county	20
Mrs. Sarah J. Morey, Eureka Mills, Plumas county	10
C. N. Bill, Eureka Mills, Plumas county	20
G. N. Starke, Grundy Centre, Iowa	30
F. P. Morrison	25
A. T. Dewey, San Francisco	12
W. B. Ewer, San Francisco	15
B. F. Watrous	10
H. L. Rutgers	20
J. W. Bashford	5
S. Comey	5
Mrs. E. O. Johnson, Deep River, Conn.	10
J. D. Dewell, New Haven, Conn.	10
Eugene B. Cutts, Carson City, Nevada	10
W. A. Merriam	10
J. T. Ford, San Bernardino	20
T. S. Ingham, San Bernardino	10
L. Jacobs, San Bernardino	2½
Total sold	1,004

Judson & Brown (San Bernardino, P. O.), owners of the tract, are energetic men, who leave no stone unturned to make their enterprise a success. They do not try to figure how little they can do and sell their land, but where they can put another thousand dollars and make the tract more desirable to first-class settlers. There is nothing shoddy about their operations. Redlands will stand in a few years as one of the finest settlements on the Pacific coast.



Hydraulic Gravel Elevators.

EDITORS PRESS.—I avail myself of a recent suggestion in the PRESS to lay before your readers a few ideas gathered from a protracted study of and experience with hydraulic gravel elevators, hoping they may be of service to others in advancing toward perfection an invention of great value to the mining community. A more careful attention to the natural laws under which the elevator works would no doubt have led before this to the invention, on the part of experimenters, of a much more perfect machine than has yet been brought before the public. But, strange as it may seem, no skillful scientist has, as yet, taken this matter in hand, the experiments with it thus far having been conducted only by practical men, who, having met with the degree of success which they sought, were content to "let well enough alone." But I do not hesitate to say that in the hands of a scientific man, familiar with such propositions, a hydraulic gravel elevator could be constructed producing a result at least 30% better than any of which we yet know.

In support of this statement, I will say that no elevator has yet been constructed to utilize more than 25% of the power exhausted, and yet the application of power is direct upon the resistance; there are no pulleys, bands or cogs—no friction of machinery to overcome. But mechanics working under these disadvantages realize from 60% to 70% of the power applied. Why is it, then, that we get such poor results? It is because experimenters and inventors have paid so little attention to the laws which should govern their efforts. The important improvements which have been made have been stumbled upon, not discovered through enlightened or systematic research.

While I do not profess to have studied in a school materially different from the others, I may say that some of these laws have forced themselves upon my attention.

Specific Gravity.

Ignoring friction, water running down hill falls as any other body; water running up hill rises conversely. In falling, it doubles in velocity every 16 ft.; in rising, it decreases one-half in speed every 16 ft. If we force a body of water up through the trunk or tube of an elevator, we must double the capacity of the trunk every 16 ft. of an elevation which it makes, because it is running at but half the velocity, and therefore requires double the space, and hence we may, with accuracy, determine the

Shape of the Trunk

Or discharge pipe, which is simply that of doubling in capacity for every 16 ft. of rise which it may have, regardless of the angle at which it reposes. Unless the trunk is so proportioned, we will have either the disadvantage of exhausting power by playing from the nozzle into a body of comparative still water in case the trunk is too large, or the still more serious one of keeping up an unnecessary velocity in case the trunk is too small.

The angle of the trunk is not a matter of great importance, but in consideration of the amount of material consumed in its construction, and the increased friction which a longer run involves, I have found 45° to be the most desirable. It is important that the trunk should be on a straight line from the nozzle for a distance of 15 or 20 ft., at least; otherwise, a large percentage of power will be lost in the shape of friction. It may, however, curve down at the upper end so as to enter the sluices more directly, and thus approximately conform to the natural curve of a projected stream of water. It may be made of wood or sheet-iron, the latter being preferred because it can be more readily and evenly tapered. The wear upon it is not great, and comes only on the bottom, so that by turning it one-eighth, a trunk made of No. 8 iron can be made to last indefinitely.

The Throat.

By this term is meant the lower end of the trunk, at the point where the material to be lifted receives sufficient impetus to carry it to the desired elevation. It is, of course, the smallest point of the trunk. It determines the capacity of the machine, and all other parts should be built in proportion to it. It is the point at which to determine the velocity of the whole material to be lifted, and from this velocity the wear and tear, and hence the manner of constructing the machine. The throat should never be elongated so as to form a neck or tube, as this would in a measure prevent the stream passing up the trunk from assuming a natural shape. The taper or enlargement of the trunk should commence at the throat, or as near to it as possible. The distance from the nozzle to the throat should never exceed the diameter of the latter, though where a limited feed is desired it may be much less. Where nothing but sand and "slickens" is to be raised, and that only to a short hight, a simple sheet-iron throat will last for some time, but where the material is at all heavy it is necessary to line the throat and the trunk for some distance above with iron dies several inches in thickness.

It is important that the throat should be neither too large or too small to perform the work required of it, as in either event great loss of power will result. To ascertain its size, several matters are to be considered. Ordinary gravel will be suspended in a flow of water rising at the rate of about three feet per second. It is necessary, therefore, that the water flowing through the trunk should, at the point of discharge, have a speed somewhat greater. I have found that a rate of six ft. per second is favorable. If we determine to discharge the water and gravel at a speed of six feet per second, it is plain that it would have to have a velocity of 22 ft. per second at a point 16 ft. below the discharge. Now the size of the throat should be just sufficient to carry all the water which we propose to use, provided the water were running at the speed which would be required to lift it to the desired elevation.

The Nozzle

Should then be large enough to give the required velocity to the whole volume of water used. For convenience, we may assume that we have a pressure giving us a velocity through the nozzle of 100 ft. per second, and that we wish to elevate material 16 ft. high. The question arises, what proportion of our water must be run at 100 ft. per minute to give the whole volume a speed of 22 ft? It will occur to the reader that, theoretically, it would take about one-fourth, or, making a very liberal allowance for friction, one-half. It is a fact, however, that if the above conditions were applied to any of the machines as now in practical use, the nozzle would have to be of a capacity to carry fully three-fourths of the water used, leaving only one-fourth for ground-sluicing or piping.

A stream of water running through a nozzle has the greatest force directly at or within a very few inches of the nozzle. It is, therefore, desirable to communicate the force or motion of the power stream to the inert mass of material to be lifted at a point as near the nozzle as possible, and to have this transfer take place within the smallest possible space. The space between the nozzle and throat is necessarily filled with water and gravel, and the greater the space the greater will be the eddy, or counter-current formed by water and gravel, which does not strike fairly into the throat, and returns to be acted upon again by the stream. The nozzle should point directly through the center of the throat.

No elevator has yet been constructed in conformity to all of the foregoing suggestions, but I may say that the best results I have ever seen obtained were in cases where they received the closest attention. HENRY DE GROOT, JR.

San Francisco, June 7, 1882.

GLENDALE, Montana, is another enterprising mining town. The Hecla company's mines and reduction works yielded last year $874,112, and the net profits were $237,728.

THE SANBORN WAGON.

The Sanborn Wagon.

We give on this page a picture of one of Sanborn's "sewing-machine wagons," which is adapted to quick, light work of many kinds. This is only one of many styles of vehicles made by Sanborn at the works at Manchester, N. H., and which has been sold on this coast for 23 years, thus proving their excellence. All the lumber is carefully seasoned to meet the requirements of a dry climate, and all parts, including axles and springs, are of thoroughly tested material. The setting of the axletrees gives the wagons an unusual ease of draft. At the Sanborn establishment, 24 and 26 Beale street, S. F., all kinds of vehicles can be had.

GARFIELD ON HOME MANUFACTURES.—Gen. Garfield said, June 4, 1878: "The people that cannot make their own implements of industry must be content to take a very humble place in the family of nations. So important in my view is the ability of the nation to manufacture all the articles necessary to arm, equip and clothe our people, that if it could not be secured in any other way, I would vote to pay money out of the Federal treasury to maintain Government iron and steel and woolen and cotton mills, at whatever cost."

SINGLE blanket capitalists are flocking into Butte City and other Montana camps in such numbers that the citizens have found it necessary to organize a 3-7-77, otherwise a vigilance committee, for self protection. Tramps and bad characters have been warned to leave, under pains and penalties.

Morse's New Gallery.

Mr. G. D. Morse, whose photograph gallery has been established in this city over 11 years, has just removed to the most complete, artistic and elegant rooms on the coast, at Phelan's block, Market St. The ascent to the gallery is by hydraulic elevators from Market and O'Farrell streets. On the fifth floor the exhibition gallery is reached, and here can be seen the magnificent work for which this establishment is so widely known. There are five parlors, all most elegantly and sumptuously fitted. The most elaborate of these is kept for ladies in evening costume, bridal parties, etc. The photographic rooms are furnished with all the latest appliances, mechanical inventions and other necessaries of the photographic art—the light is perfect and the surroundings so beautiful that a visitor, free from all disturbing elements and with mind harmonized, looks his best, and is sure to make a good picture. Mr. Jenks, whose works in oil painting are so noted, Mr. Koch, who has a great reputation for ivory-type and water colors, Mr. Hasselman, a crayon and porcelain painter, and Miss Buckman, a fine colorer of "cabinets," locket pictures, etc., are among the artists employed there. With such an establishment, success and overwhelming patronage must result, and we strongly recommend all our country friends when they visit San Francisco to pay a visit to this, one of the most magnificent galleries in America.

TONITE.

POWER WITH SAFETY.

Another and Incontrovertible Proof of the Unparalleled Safety of

TONITE.

At the burning of the Dry House at the Tonite Powder Works on the night of June 8th, where several trays of one of the ingredients used in the manufacture of Blasting Caps completely exploded, making a loud report, nearly a ton of Tonite in an adjoining compartment, separated only by a thin wood partition, caught fire, and was almost entirely consumed, but NOT ONE OUNCE OF THE POWDER EXPLODED.

The wire trays on which the Powder lay and the steam-pipes under the trays were not one of them broken or blown out of place, and a lot of the Powder partially burned was recovered from the fire.

Some of these Cartridges can be seen at the Company's office. The above is, perhaps, the severest test that any high-explosive was ever put to.

This Company Manufacture, also, Detonators, Electric Exploders, Etna Caps, Torpedoes, Distress, Fog and Alarm Ship Signals.

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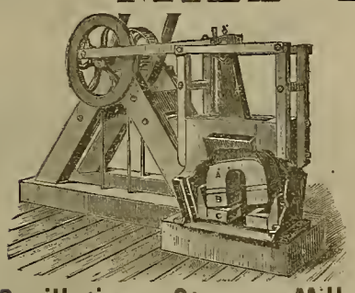

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It has no Stems, Cams, or Tappets, and adjusts itself to the wear of the Shoes and Dies.

For simplicity, economy, durability and effective working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power. Awarded First Premium and Medal at Mechanics' Fair, S. F., 1880.

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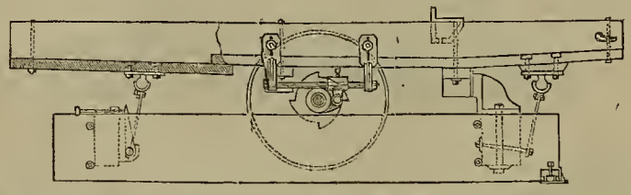

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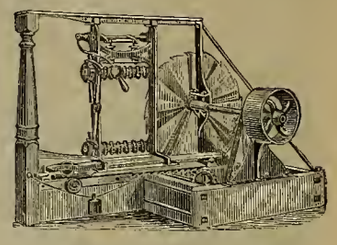
The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

☞ Send for Circulars. ☜



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For simplicity, durability and rapidity of action, these Machines have no equal, cutting from 3,000 to 4,000 per hour They are now used by all the principal Millmen on the Pacific Coast.

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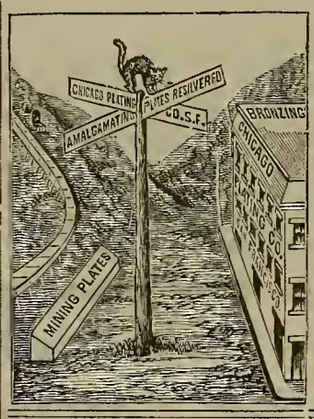

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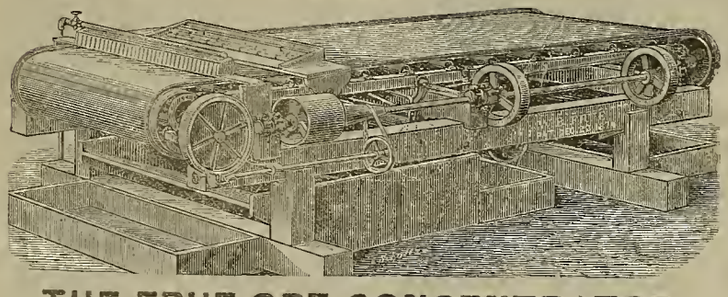

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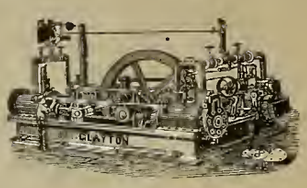

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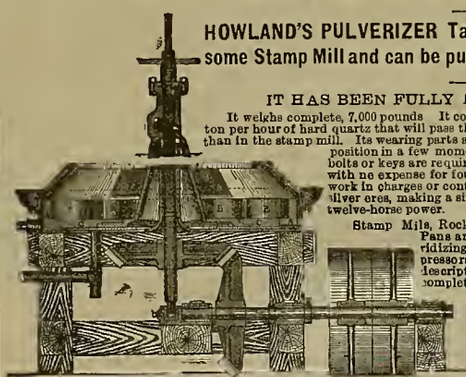
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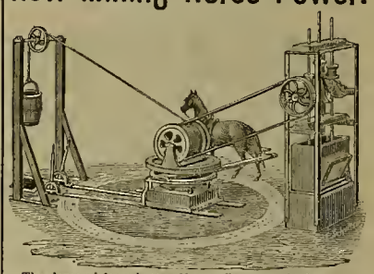
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Electrical Apparatus and Processes for the Mining and Metallurgical Engineer.

[Read before the American Institute of Mining Engineers by N. S. Keith, of New York.]

No one of the live subjects of the day, to which the attention of the mining engineer and metallurgist should be turned, is of greater interest to him than electricity, in its applications to various mechanical, chemical, and metallurgical operations. The object of this paper is to call the attention of my fellow members and associates of the Institute to various new, as well as comparatively old, developments in the science and art of electricity, which seem to promise results of advantage.

Too many of the comparatively old applications have been neglected by the mining engineer, which, if he had given them a place among his appliances, would have assisted him greatly. The telegraph may be noticed as one. Its use is, however, confined to a person having skill in the manipulations of the key, the reading of the alphabet, and familiarity with the sounder. One of the simpler forms—the call-bell—has a range of application far greater, as to distance and convenience, than the old wire-pull, or the hoarse voice of the windlass-man or the bucket-dumper. A few Laclanche cells, two or more electric bells, and a mile or more of wire judiciously placed, will put the superintendent, at his office, in communication with the foreman of his mills and mines, so that by aid of a code of signals, great advantages may be gained without necessitating a knowledge of the Morse alphabet, or of the mechanical voice of the sounder. The telephone furnishes a means of communication between the often widely separated places of duty, which will save many a step, much loss of time, and wear of horse and body. It can be used by anyone who can speak.

But I wish to call attention particularly to a description of new applications of electricity which the miner and metallurgist will find, before long, so essential to his profession that their

Theory and Practice will be Taught in the Schools,

The same as metallurgy, mineralogy, and chemistry now are. That which we may call the new electricity is due to the practical development of the theory of the conservation of energy, and the consequent production of mechanism for the generation of currents of electricity of any desired quantity and intensity. So new is this electricity, in fact, that even the recent graduates know little or nothing of its modes of production or of its applications in practice. I will speak of the

New Applications,

Which are the result of the extensive production of machinery for generation of electricity. First comes that which appeals sensibly to the eye—light. It has been fully determined that there is no light, except daylight, as cheap as that produced by the voltaic arc; none so pure in color, none so bright. Many arc lights are in use in rolling-mills, machine-shops, hydraulic mines, surface works, and other places. The miner needs the electric light in the shaft-house, the stamp-mill, and at the furnace. If he has no engine at the shaft-house, this one at the stamp-mill or furnace can be used to run an electric generator, so that not only his shaft-houses can be illuminated, but also his mill or furnace, and even the road between, much cheaper than he can produce one-tenth of the light by the use of candles or kerosene, and with much greater safety.

It is doubtful, however, whether the voltaic arc light will be of any great practical utility in narrow veins of mines, because the light produced is too great in quantity and much more than is needed, by far, in the narrow spaces. Nor in the headings or stopes is it applicable, as it requires in such places too frequent moving. The work at the new railroad tunnel through Bergen Hill, at Weehawken, is successfully and economically lighted by 11 arc lights placed upon the circuit from one electric machine, two and one half miles long. The conductors are of well-insulated copper wire, carried along the ground upon poles, down and up the shafts, and into the various headings. The men can do more and better work in the good light. In lighting the banks at hydraulic mines, in iron-ore pits, in open cuts of railroad work; in fact, in all large spaces in which night work is carried on, this light has no equal.

Take now, some of the applications of

electricity which can be Used by the Miner

And metallurgist, if he has at his main engine, or water-wheel, a suitable generator of electricity. He may be sinking a shaft at the top of a mountain where it would be impracticable to place or operate a steam engine. If he places there an electric motor and connects it with a generator by conducting wires, he will have power at his command at the shaft, which, by the mere turning of a switch-handle, will work the whim or windlass, and hoist ore or rock, or work a pump. I have an instance at hand where electricity is now used in mining for the transmission of power, in the Loire valley, in France, at the works of the Compagnie de la Ferrooiere. One Gramme machine is employed as a generator of electricity, and another as a motor attached to a drum, which stands at the head of an inclined plane 110 metere long, with a grade of four centimeters per meter. The generator is 1,200 meters from the motor. The load raised is about 800 kilograms (1,760 pounds), and the ascent is made in one minute and a half. The work goes on with great regularity. The starting and stopping can be done as gently as desired. By means of a galvanometer in the circuit, one can tell at any moment what is being done at the incline, whether the work is stopped, whether the wagons are coming up filled, or not, etc. The work is about two-thirds of a horse power.

By means of this current one can

Ignite Blasts and Work Electric Drills.

Which are said to be economical in comparison with the steam drill. The operator can stop and start at will, and have all the advantages of mechanical movements, without the constant personal attention of an engineer at the shaft. He can light all his works from a central station at the mill, or other place where he has available power. Branch wires can be taken to the laboratory, where the electric current will aid him in his analyses and tests, and with it he can heat, boil, cupel, roast, and perform all the operations of the laboratory which require heat, power, or the determination of chemical affinity. It will detect imperceptible flaws in iron and steel bars, and determine the amount of carbon in steel. Think of melting metals by the fall of water! The suggestion of it even, not so many years ago, would have secured our excommunication.

It would take too long, and far exceed the proposed limits of this paper, for me to enter into the particular modes and apparatus for carrying on the various operations which I have enumerated; but I will briefly describe a few practical operations which can be carried out on a large scale.

For quite a number of years, in the neighborhood of Swansea, in Wales, a method of refining copper and separating such gold, silver, and other metals which the impure copper may contain, has been in practical operation on a large scale. Plates of black copper are made the anode in an electrolytic bath, consisting of a solution of sulphate of copper. Other thin plates of pure copper are made the cathode in the bath. By the electrolytic action of the current, produced by an electric generator, copper alone is dissolved from the black copper, and is deposited in a pure state upon the cathode. The impurities of the black copper sink to the bottom of the vat, and are removed from time to time and treated for their contents of gold and silver. The cathodes, as soon as they have reached the proper weight, are removed, and the copper therein is melted and cast into pigs for market. This process has been found more economical than any other for accomplishing the same result.

An analogous process is the one invented by me for the

Refining and Desilverization of Base Bullion.

The bullion, in plate, is placed in a solution of acetate of soda and sulphate of lead, and is so connected with the source of electricity as to be an anode, while plates of other metal are the cathode. Lead is dissolved and deposited electrolytically; and the deposit is practically pure. I have invented an improvement on this process, which consists in taking the skimmings of zinc, lead and silver, which come from the kettles in the process of desilverization by means of zinc, and putting them in bags as an anode, dissolving both the lead and zinc, electrolytically, and depositing them together as an alloy, or mixture, upon the cathode plates. The contents of gold, silver, etc., are retained in the bags, and are treated for these metals by smelting. The combination of pure lead and zinc is removed from the cathode and added to the next, or some other succeeding lot of base bullion, put into the kettles for desilverization, and in that manner the process continues. In place of treating the whole mass of bullion by electrolysis, I get, in the first place, by the zinc desilverization, say, 80 % of the base bullion as market lead; and, say, 22 % of a mixture of rich lead and zinc, which goes to electrolytic treatment. By adding, then, the pure lead and zinc to the succeeding lot of bullion, I effect the desilverization, and remove from it, as market lead, an amount approximately equal to the quantity of lead which is in the bullion placed in the kettle.

The process which has within a year or two been re-introduced by Siemens for

Melting Steel by Electricity

Can be applied to melting other metals and materials. The apparatus for this operation is comparatively simple. Take a black lead crucible of proper size and put it in another suitably larger, and in the space between the walls of the two pack some good non-conducting material, like asbestos. Introduce through a hole in the bottom of this combination a carbon rod, like one used in the electric arc light, and lute around it well with a paste of clay and graphite, so that it forms a conductor to the interior of the inner crucible. Next provide a cover, with a hole in the center of a size to freely admit another carbon rod. Now place above the crucible the mechanism of an electric lamp, so that the carbon carried by its movable rod can enter the crucible through the hole in the cover. Place in the crucible an amount of steel, or other metal, put on the cover, pass through the hole in it the carbon rod, and connect it with the movable carbon carrier of the lamp; connect the body of the lamp with the positive pole of the current generator, and then connect the carbon which passes through the bottom of the crucible with the negative pole. Immediately the upper carbon will be automatically withdrawn slightly from contact with the metal in the crucible and form a voltaic arc at that place. Fusion goes on rapidly, so that some pounds of steel can be fused in 20 minutes. The lamp mechanism serves to keep the carbon rod at its proper separation from the metal. Siemens says that there is no other equally economical mode of fusing small amounts of steel, because there is none which so concentrates the heat upon the material which it is desired to fuse. In fact, the fusion takes place before the outer crucible is raised any considerable degree in temperature.

The Latest Development in Electricity

Is in the so-called "storage" of it. By the term "storage of electricity," I do not desire to be understood literally, any more than I would be so understood in speaking of the store of heat in coal. It is merely a convenient term which avoids giving a chapter in physics. The first storage of electricity, other than in its so-called static condition, was effected by Plante in his well-known secondary battery. In this case, as in all subsequent arrangements for storage, energy is absorbed in the decomposition of water by electricity, which is again given up as a current of electricity when the proper circuit is furnished; or, better said, when the proper association of materials is made. The value of this arrangement of Plante, and the scope of application of its modifications, has not been recognized until recently.

There is nothing to be gained by expending zinc and acid for the production of electricity to effect chemical decomposition for sake of the subsequent reverse actions as electric current, for the battery can be used directly whenever such current is desired. But the recent mechanical means of generating electricity have so cheapened its production that it is now sometimes desirable to store up the electricity produced, as it were, in some portable form, so that it may be utilized in a place which is not available for its direct production and use.

The line of development which has received the greatest attention is the one of which Plante's secondary battery is the type. Faure's arrangement is the most prominent. The capacity of both depends upon the porosity of the surfaces of two lead plates; one in connection with the positive, and the other with the negative pole of a source of electricity. Plante's cell acquired its limited capacity by the result of repeated oxidations and reductions, effected electrolytically, of the surfaces of the lead while in a bath of acidulated water. Faure increased this capacity by applying a coating of oxide of lead directly to the lead plates, so that the increase on a given surface, in comparison with Plante's, is in the proportion of 2,000 to 75.

The Operation of Charging and Discharging

These cells is as follows: A source of electricity, having an electro-motive force somewhat in excess of two volts, is connected, as before stated, with the two lead plates in a bath of water acidulated by sulphuric acid, and the current is allowed to flow in them for a time, limited by the current and capacity. The result is that the coating on one plate is peroxidized, and this other has its coating of oxide reduced to metallic lead. If the source of electricity be then disconnected, and the wires which are attached to the lead pipes be kept separate, the charge will be only very slowly dissipated. But if the wires be connected, either directly or through any conducting substance, an electric current will flow in the reverse direction to that which was passed through the arrangement from the source of electricity, until the original condition of oxide on both plates is resumed. The action of the current through the plates is first to decompose the water of the solution in which the plates are immersed; the oxygen goes to the positive plate and is absorbed in peroxidation, while the hydrogen goes to the negative plate and acts there as a reducing agent, making metallic lead from the oxide. The reverse action takes place when the wires are connected. So it will be seen that the original electric current determined a chemical affinity, which, when circumstances allow, re-asserts itself with the development of a current of electricity. On a future occasion I expect to be able to describe a storage battery of my own invention, the particulars of which I am not at present prepared to give.

Sir William Thomson found 1,000,000 foot-pounds of electrical energy stored in a box weighing, with its contents, 180 pounds, made by Faure, at Paris, which he set free by use in Scotland.

The decomposition of only one pound of water by electricity absorbs about 5 300,000 foot-pounds of energy, which can be drawn at will from the storage battery through an electric motor. This equals two and two-thirds horse-power for an hour. The waste of power in the process of storing is not yet well determined, but the economic results promise to be favorable, and if expectations be realized, the applications of "bottled electricity" will be many.

Discussion.

Prof. C. O. Thompson: Can you give me any information with regard to a possible pollution of the atmosphere by the electric light through the formation of compounds of oxygen and nitrogen?

Mr. Keith: I cannot say that there are any specific data on this point. Ozone is probably formed, and that may possibly act upon nitrogen of the atmosphere to form nitric acid. Some investigators have said that nitric acid can be detected in the neighborhood of the voltaic arc, but not in deleterious quantity. Ozone acts to oxidize organic matter, and to that extent may be a purifier of the atmosphere.

Mr. G. W. Maynard: I am glad to bear testimony to the utility of the electric light in mills. I have seen it in use in several mills having from 26 to 60 stamps, with great success. The apparatus used were generally those made by the Brush company, and of the arc type. The light has a very penetrating quality, especially useful in the dust of dry stamp-mills. Under its use the amount of work done by employees is very materially increased.

Electricity is used for the refining of black copper in South Wales, by the Messrs. Elkington. I believe they use a chloride solution instead of a sulphate, so that insoluble chloride of silver is formed at the anodes. A very large number of tanks are used, and the electric generators are those made by Wilde, of Manchester, England. This process is also in use at Mansfield, Hamburg, and other places in Germany.

Mr. H. M. Howe: Will Mr. Keith tells us whether one pound of his apparatus, including apparatus and contents, will contain as much energy as one pound of coal; and, also, roughly, what will be the cost of 1,000 foot-pounds as stored in this manner, that we may see how the cost of energy so stored compares with its cost when stored in coal?

Mr. Keith: The comparative aggregates of energy are due to the combinations of two elementary substances in each case. In one, to the union of oxygen and carbon for heating water in the production of steam for an engine; and in the other case to the union of oxygen and hydrogen to form water with an incidental current of electricity. The amount of energy due to these unions is well known. Twelve parts of carbon combine with 32 of oxygen to form 44 of carbonic acid, with a freeing of energy equal to about 11,000 foot-pounds. Two parts of hydrogen combine with 16 of oxygen to form 18 of water, while 6,800 foot-pounds of energy are freed. Our best steam apparatus utilizes scarcely 10% of the energy due to the combustion; but it is a very poor electric motor which will not utilize more than 50% of electric energy applied to it. Some recent machines are said to utilize from 85% to 90%. Thus, it will be seen that, pound for pound, the electric energy is the greater. The energy due to the union of oxygen and hydrogen to form a pound of water exceeds 5,000,000 foot-pounds; and this can be stored for use electrically in apparatus weighing not 200 lbs.

Mr. Howe: So there is more available power in one pound of your machine than in one pound of coal?

Mr. Keith: I cannot now say that, when we take into consideration the weight of apparatus. But in the matter of materials which go to develop the energy; yes, and in the proportion of about fourteen to nine. And in the matter of available energy, this is probably large enough to more than counterbalance the weight of apparatus.

Prof. Silliman: I have had some experience in the deposition of copper by the dynamo-electric machine, both practically and theoretically. The process may, in my judgment, be made a commercial success. In the particular instance to which I allude it was not commercially successful for the want of a large enough dynamo. We had not at that time one of sufficient "quantity." One was begun by Mr. Weston, at Newark, of suitable magnitude, but failed of completion owing to destruction of his works by fire. It is merely a question of cheapness of power and the use of a suitable dynamo; always with the understanding that the attempt must not be based upon doing work beyond the capacity of the dynamo.

Steel wires are coated with copper at the works of Wallace & Sons, at Ansonia, Conn., for use in telegraphy. Copper enough is deposited on them by electricity so that small, strong conductors are produced, equal in conductivity to the much larger and heavier iron wire heretofore used.

Mr. Keith: I doubt the relative economy of the use of electricity in the separation of gold from silver. The process used in the Government assay office and mints gives by-products, which pay very much of the expense of separation by means of acids.

Mr. Howe: While black copper is successfully refined electrolytically at Birmingham and Mansfield, copper refiners in this country in vain endeavor to learn how to do it. I have clients who would pay any reasonable price to the man who could carry out the electrolysis of argentiferous black copper rapidly and cheaply. This is one of the great needs of the copper industry in this country.

A very interesting process for the extraction of aluminum from its oxidized compounds has lately been described to me by its inventor. The aluminous compound is placed in a carbon crucible, which is connected as the cathode of an electric current of great intensity. A voltaic arc is then thrown across from another electrode against this carbon crucible, the current thus first melting and then decomposing the aluminous compound, and metallic aluminum being deposited on the sides of the crucible.

Mr. Keith: I have heard such a process vaguely hinted at, but must say that I do not understand how aluminum can be produced except by some variation of this process.

A RECENT clean-up of Silver Bell (Arizona) ore at the smelter gave 100 bars of silver bullion and two tons of matte, which was shipped through Blake & Co.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING JUNE 6, 1882.

258,871—ELECTRO-MAGNETIC ACTION FOR MUSICAL INSTRUMENTS—Cyrus N Andrews, S. F., Cal.

258,980—ORE CONCENTRATOR—A. Blatchly & G. Kustel, S. F.

258,881—VALVE FOR COLLAPSIBLE FLOATS—Albert Bosshard, S. F.

259,143—DEVICE FOR CATCHING FISH—Thos. Heaton, Vancouver, W. T.

259,150—OBTAINING MAGNESIUM SULPHATE FROM CRUDE MINERAL—Fred'k. Hohlweg, S. F.

259,030—WOOD PRESERVING COMPOUND—John C. Marshall, Oakland, Cal.

259,184—WATCH OILER—W. W. Martin, Salem, Oregon.

259 189—COMBINED BEDSTEAD, TABLE, ETC.—Mary A. McMaster, Antioch, Cal.

259,201—COMBINED HEADER AND THRASHER—Wm. H. Parish, Salem, Oregon.

258,946—EDGER—James A. Robb, San Jose, Cal.

258,953—ROTARY PULVERIZER—James O. Stewart, Alameda, Cal.

258,958—PNEUMATIC COUNTER BALANCE FOR PUMP RODS OF DEEP WELL PUMPS—Wm. F. Toothaker, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

News in Brief.

A ST. LOUIS syndicate is said to have expended $1,500,000 in the purchase of mines and railroads in the coal regions of southern Illinois, with the intention of creating a new steel manufacturing city.

A CORRESPONDENT of the New York *Times* says that in the safe of the late Moses Taylor were 25,000 railroad bonds of $1,000 each ($25 000,000), piled up open, sheet upon sheet, in great stacks. These formed but one item of Mr. Taylor's wealth.

SENATOR MILLER, of California, has introduced a bill similar in its provisions to the Rosecrans bill, granting the right of way through the Presidio military reservation to the San Francisco and Ocean Shore railway company.

COMMANDER PARSON, commanding the *Wachusett*, reports to the Navy Department, under date of Fort Wrangel, Alaska, May 19th, that perfect quiet and good order exists in all parts of the Territory.

THE Buckeye flour mills, at Marysville, which have been using about 2,000 cords of wood annually, will on the 15th instant abandon the use of wood, and thereafter use Lincoln, Placer county, coal exclusively.

THE Grand Trunk railroad has had a passenger blockade. There were 4,000 immigrants at Quebec waiting for transportation to Toronto, and detained several days while additional cars were being prepared for their use.

THE western end of the Denver & Rio Grande railroad is nearly completed to Salt Lake. It is said that all the force possible will be put on the Colorado and Utah division, so as to have the trains running from Denver to Salt Lake by January 1st.

GEN. IGNATIEFF, at his own request, has been relieved from the post of Minister of the Interior, on the ground of ill-health, and has been appointed President of the Academy and a member of the Senate. He retains his membership of the Council of the Empire and his Adjutancy.

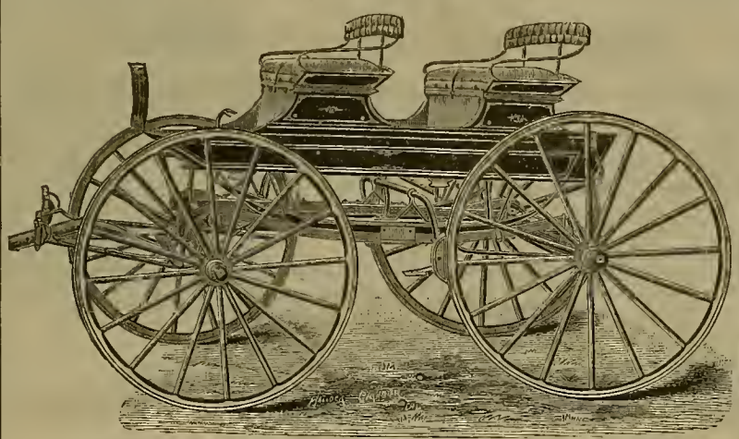
Benicia Agricultural Works.

We lately paid a visit to the above-mentioned works, and was fairly surprised at their extent and completeness. The principal owners are Messrs. Baker & Hamilton, of this city and Sacramento. The factory was formerly located at San Leandro, and was known as the Sweepstake Plow Company.

The Benicia Agricultural Works comprise foundry, machine, wagon, smith's, paint and finishing shops, covering a floor surface of nearly two and a half acres.

The wharf connected with the works is over 600 ft. in length. All the machinery is entirely new and of the best description, with all the latest improvements. Over 200 skilled mechanics are engaged.

The overland train passes through the



THOROUGHBRACE WAGON, OF BENICIA AGRICULTURAL WORKS.

works and stops to deliver and receive passengers.

One of their specialties is the manufacture of spring, express and thoroughbrace wagons, and of every description, to order.

We herewith give an illustration of their thoroughbrace wagon. Other illustrations appear in the advertisement on another page. Their premises are well worth a visit, and we recommend our readers to call at the works and see for themselves.

Cylinder Printing Press for Sale.

A large cylinder Hoe printing press, for country newspaper work, can be bought cheap by addressing Press, Box 2361, S. F.

Mining and Other Companies.

Seaton Gold Mining Company.—Location

of principle place of business, San Francisco. Location of Works, Drytown, Amador County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the sixth day of June, 1882, an assessment, (No. 1) of Fifteen cents (15) per share was levied upon the capital stock of the corporation, payable in U. S. gold coin to the Treasurer, A. Warner, at his office, No. 224 Kearny St., room 2, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Twenty-first day of July, will be delinquent and advertised for sale at public auction; and, unless payment is made before, will be sold on Wednesday, the Sixteenth day of August, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. A. MARTIN, Sec'y.

OFFICE—Room 6, 628 California street, San Francisco, California.

DIVIDEND NOTICE.

OFFICE OF THE

EUREKA CONSOLIDATED MINING CO.

Nevada Block, Room 37, San Francisco, June 15, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 74) of Fifty Cents per share was declared payable on the capital stock of the Company, on Tuesday, the 27th day of June, 1882. Transfer Books closed until the 28th instant.

P. JACOBUS, Secretary pro tem.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company.

San Francisco, June 7, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 30) of Twenty-five (25) cents per share was declared, payable on THURSDAY, June 15, 1882, at the office of the Company, Room 19, 328 Montgomery street, San Francisco, Cal. Transfer books will close June 9, 1882, at 3 P. M.

JOSEPH NASH, Sec'y.

Gaudalupe Silver Mining Company—Lo-

cation of principal place of business, San Francisco, California. Location of Works, Urique, State of Chihuahua, Mexico.

NOTICE—There are delinquent upon the following described stock, on account of assessment No. 23, levied on the 28th day of April, 1882, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Certificate.	No. of Shares.	Amount
Lee, R. B (estate of)	19	2	$100 00
Stetson, E. J.	27	1	50 00
McPherson, J. B (estate of)	13	1	50 00
Haynes, T. J (estate of)	20	2	100 00
Haynes, T. J. (estate of)	30	1	50 00

And in accordance with law and an order of the Board of Directors, made on the 28th day of April, 1882, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the company, room 13 No. 109 California street, San Francisco, California, on Monday, the Third (3d) day of July, 1882, at the hour of 2 o'clock, P. M., of said day to pay said delinquent assessments thereon, together with the costs of advertising and expenses of the Sale. WM. BLACKWOOD, Sec'y.

OFFICE—Room 13, No. 109 California street, San Francisco, California.

Norwich Gold and Silver Mining Company.

Location of principal place of business, San Francisco, California. Location of Works, Glencoe Mining District, Calaveras County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 5th day of June, 1882, an assessment, (No. 1) of Twenty cents (20c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 310 Pine street, room 15, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 19th day of July, 1882, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 31st day of July, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. A. L. PERKINS, Sec'y.

Office—319 Pine St., room 15, San Francisco, California.

ASSESSMENT NOTICE.

Gould & Curry Silver Mining Company.

ASSESSMENT, NO. 42.

Levied	May 23, 1882
Delinquent	June 29, 1882
Day of Sale	July 20, 1882
Amount per Share	Fifty Cents per Share

ALFRED K. DURROW, Secretary.

Office—Room 69, Nevada Block, 309 Montgomery St.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, June 2, 1882.

At a meeting of the Board of Directors of the above named Company, held this day, dividend No. 42, of seventy-five cents (75c.) per share was declared payable on Monday, June 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Company in New York.

WM. WILLIS, Secretary.

Office—Room No. 29 Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

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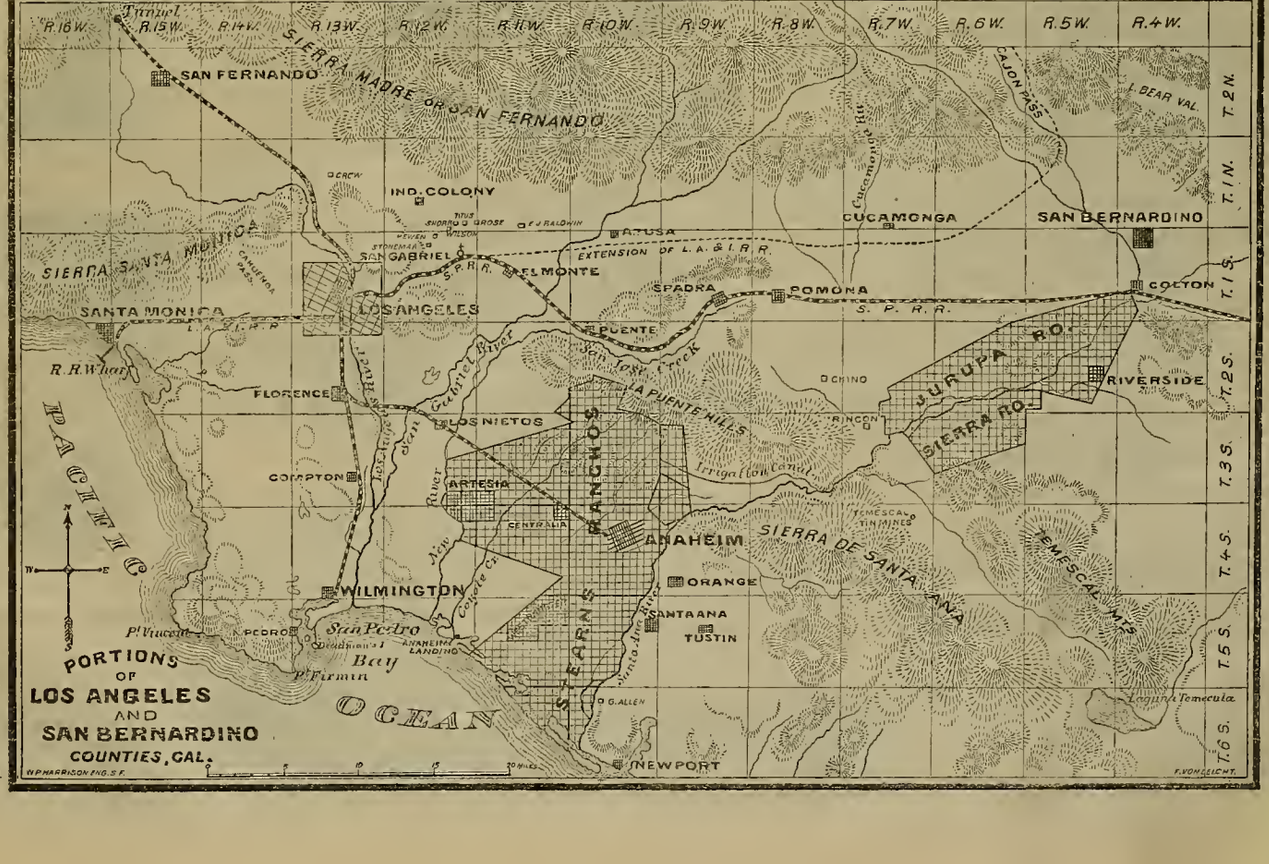

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" 0	" 1500 lbs	"	"		150 00

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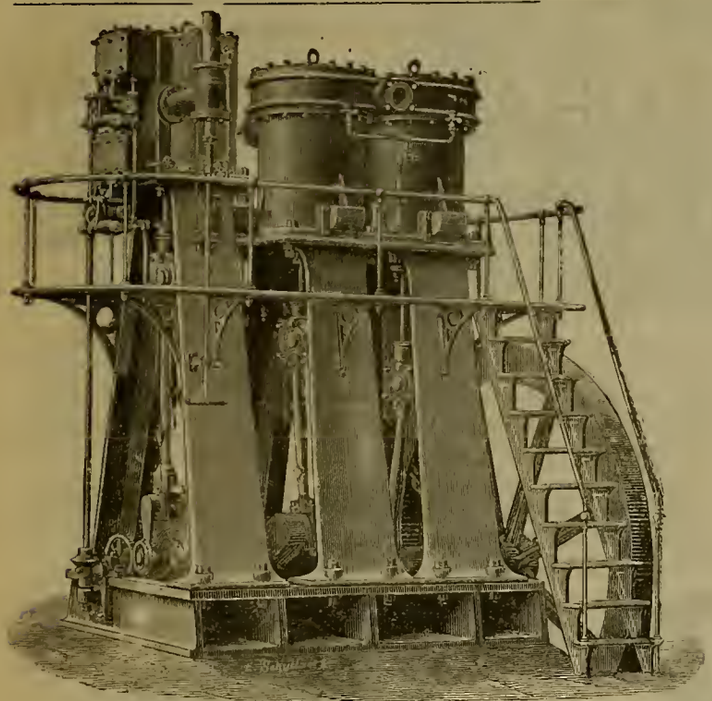

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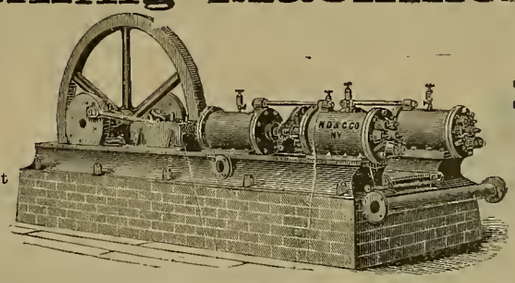

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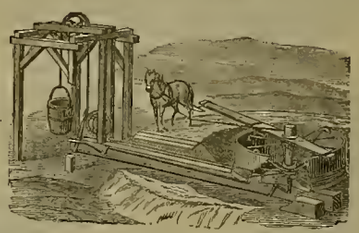

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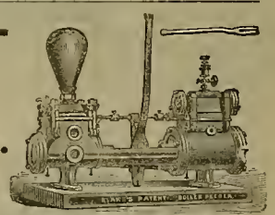

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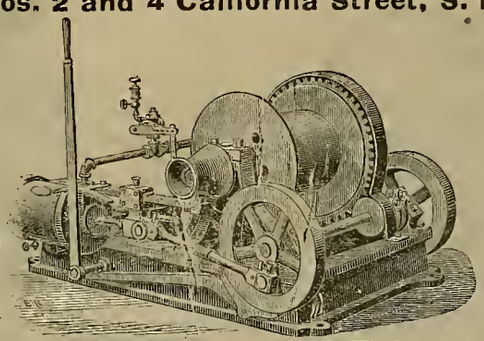

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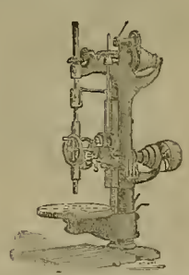

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Makes to order Gents' Fine French Calf Boots from $6 to $10; Gaiters from $3 to $6; Alexis from $3.50 to $5; Mens' Heavy Rip Boots, $6; Oxford Ties, French Calf, $4; California Leather, $3.50; Men's Working Shoes from $2.50 to $3; Children's Shoes made to order. Persons in the country ordering to the amount of $12, I pay the express charges. I sell nothing but my own manufacture.

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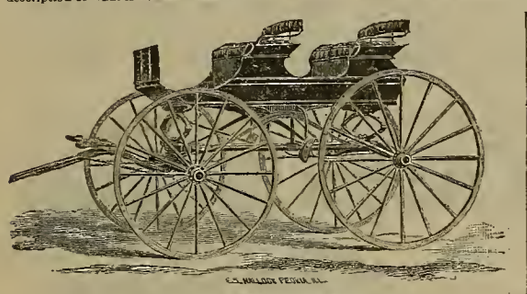
Recently removed from San Leandro to Benicia, Cal. Formerly Sweepstake Plow Co. The Largest and Most Complete Agricultural Works on the Coast. The buildings are over 1600 feet in length, and have a floor surface of 105,412 square feet, or nearly 2½ acres. The Wharves, connected with the Works by rail, are over 600 feet in length, and have a floor surface of more than 40,000 square feet, including warehouse. The Machinery is entirely new, of latest improved patterns throughout. With this Mammoth Establishment and skilled mechanics in every department, we are prepared to build every kind of implement to order, and parties needing suggestions or assistance in perfecting inventions will have the best kind of aid and assistance, thereby saving time, labor and coin. Our facilities are such as to insure rapid work and prompt shipments, either by rail or water, thus making a good saving for parties in the interior who order goods from these Works. We particularly invite correspondence from the country, and prompt responses will be sent to all inquiries.

SPRING WAGONS.—The increasing popularity and demand for our Spring Wagons, warrants us in claiming for them a superiority over other wagons in this market. We claim a thorough knowledge of the business, acquired by years of experience in both the mechanical and practical construction. With improved machinery and skilled mechanics—using material of the best quality, timber thoroughly seasoned and put together with the utmost care—we challenge comparison with other manufacturers in price for the same quality and finish. We do not compete in prices with the manufacturers of Spring Wagons of an inferior quality, nor shall we impair our work in order to reduce the price, but will build to order Wagons and Vehicles of any kind required, which, for general proportions, style and finish, cannot be excelled on the Pacific Coast, and at a reasonable price. We make a variety of styles, although our Standard Wagons—which we keep in stock and make a specialty of manufacturing—are Nos. 0, 00, 1 and 3. Some of the other styles we do not usually keep on hand, but will build to order. We also manufacture in large quantities and keep in stock (No. 12) Buckboards, as shown in cut below. We manufacture all classes of heavy and light Thoroughbrace and Spring Wagons to order, paint them any color desired, and trim with any kind of material which may be preferred, due notice being given us.

WHEELS.—During the past ten years we have tried almost every description and found none that were strictly adapted to our California climate until we had them built in accordance with our own ideas, based upon years of experience. We now claim to have the best wheel made, being so constructed that they are proportionate in all their parts, with strength and size where required, while the hubs can neither check, swell nor decay and the grease cannot work through as with other wheels. The entire hub is covered both front and back with two malleable flanges, the outside flange forming the hub band. We have abandoned the use of the Rouse band, which comes higher and is not as good, and will put these wheels on all our wagons unless ordered wood hub. As soon as received from the factory they are passed through boiling oil and placed in the dry house until ready for use. Gearing is best selected Hard Wood, made to our own patterns. Body, best of seasoned Ash, Alder and Sugar Pine, well proportioned. Wood Work all receives a thorough coating of boiled oil, filling the pores of the wood—enabling our Wagons to stand the hot Summer weather of the interior. Springs—Best brand of Swedes Steel, oil tempered; thoroughly tested and warranted, and like our wheels and axles made strictly to our patterns, and for our class of work only.

PAINTING is not excelled in any part of the United States, and material of best quality. The wagons complete are the best that can be made for the money, and are all that can be desired. Stylish, easy running, durable and first-class throughout. We do not prepay freight. Orders from persons unknown to us must be accompanied by the cash, or a convenient satisfactory reference. If a cut is not shown of the wagon desired, please call on us, or our agents, or write us a full description of what is wanted—with an order—and we will guarantee to fill it with satisfaction to the customer and credit to ourselves.



No. 1.—With Pole and Brake.

No. 1 is a stylish 4-Spring Wagon, with Pole and Brake, and 1¼-inch axle. It is adapted for, and extensively used as a Family Carriage—taking the place of a Carriage for that purpose. The seats are easily removed; has a drop tail board, and, for general business purposes, pleasure excursions, picnics, etc., it cannot be excelled. Its style, finish and general appearance makes it a very popular wagon with all. Side Springs, 1¼ inch, 5 leaves. End Springs, front, 1¼ inch, 3 leaves; hind, 1¼, 4 leaves.

Price List:

With Wood Hub Wheels.....$220.00 | With Sarven Patent Wheels.....$225.00
Pole for No. 1,$24.00. Shafts for No. 1, $15.00. Brake, $15.00.

No. 1.—With Top.

No. 1, with Top, is a popular Family Wagon and Carriage, and is of the same mechanical construction, style and finish as No. 1 without Top. It is a neat standing Top, with drop curtain; is nicely trimmed and handsomely painted. The Top can be quickly removed if desired, and an open wagon made of it. It takes the place of a more costly vehicle, and supplies a want long felt for a stylish cheap Carriage. Axle, 1¼ inch. Springs same size as used on No. 1.

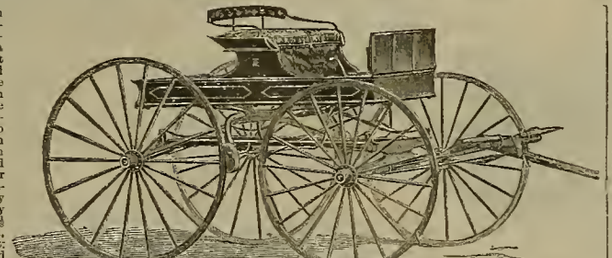
Price List:

With Wood Hub Wheel.....$270 | With Sarven Patent Wheel..$275

No. 3.—With Pole and Brake.

No. 3 is built very much on the style of our No. 1 Wagon, 4 springs, but has 1¼-inch axles and heavier springs, intended for heavy work and loads; has a drop tail board and good length of body, while the seats are easily removed. It is used as a Grocery and Express Wagon; and for farmers who require a wagon for family use and farm purposes, we can highly recommend it. Price List:

For Open Wagon, Wood Hub Wheel..$225	Sarven Patent		$230
For No. 1 Top Wagon " " .. 275	" "		280
Pole only	24	Brake only	15



No. 0.—With Pole and Brake.

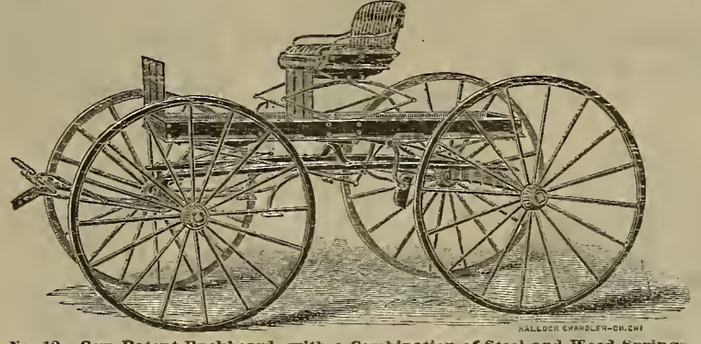
No. 0, as shown in cut, is a light Business Wagon. It is extensively used as a Delivery and light Express Wagon, and is made with Pole and Brake, or with Shafts only. The springs are so constructed as to take up what they lengthen out; are hung upon jacks, and will hold up a much heavier load than springs attached the ordinary way. It is stylishly painted. Axle, 1¼ inch. Springs, ⅞ inch, 5 leaves. Price List:

With Shafts and Wood Hub Wheel, $155; with Pole only and Wood Hub wheel $167; Sarven Patent Wheel, with shafts $160; Sarven Patent Wheel, with pole only, $172. Add to above prices for Brake, $12. No. 0 Shafts not leathered, $12; No. 0 Pole, $24.

No. 00.—With Patent Equalizing Rods.

No. 00 is a light Side-spring Wagon—or Buggy—put up with our Patent Equalizing Rods, which cause the body to set level when unevenly loaded; that is, when the load is upon one side, the body will remain level, and not tip sideways, as is common with side springs. It also makes it ride much easier. Its price makes it popular as a Business Wagon as well as Buggy, it being light, stylish and neatly painted. Axle, 1 inch. Springs, 1¼ inch, 4 leaves. Price List:

With Shafts and Wood Hub Wheel, $160; with Pole only and Wood Hub wheel $170; Sarven Patent Wheel with shafts only, $165; Sarven Patent Wheel with pole only $.75. No. 00 Shafts leathered, $15. Brake for No. 00 put on, $12. Pole for No. 00, $24.

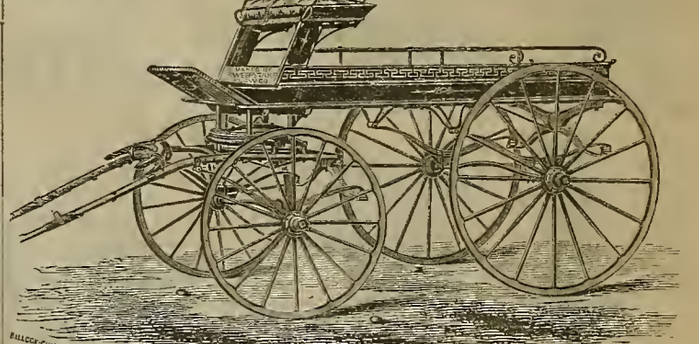


No. 12.—Gem Patent Buckboard, with a Combination of Steel and Wood Springs.

Is Stylish, Light, and Easy Running, nice for Business or Pleasure. The Hill's Patent Buckboard is fast coming into favor on account of its combining all the essential points required in style, shape and workmanship. The flexibility of the steel springs, combined with that of the wooden side bars, secures an ease in motion not heretofore attained in Buckboards.

PRICE LIST.

1 inch Axle, Shafts, Sarven Patent Wheels, Iron Dash.....$133.00	With 1¼ Axle, add to above prices		5.00
1 inch Axle, Pole, Sarven Patent Wheels, Iron Dash..... 145.00	With 1¼ Axle, add to above prices		10.00
1 inch Axle, Pole & Brake, Sarven Pat Wheels, Iron Dash... 155.00	With Leather Trimming and Dash, add to above prices...		8.50
With Leather Dash, add to above prices	2.50	With high lazy back, same as shown in cut, extra	2.50



No. 4—Platform Grocery Wagon.

No. 4 is made only to order. It is intended for a Grocery Wagon, and is an elegant and well-made vehicle and well adapted for that purpose. The wheels turn under the body like those of a hack, thus enabling it to turn in a confined space. It has become very popular; it is in every way complete. It has only to be seen to be appreciated. Nothing better in its line can be found.

PRICE LIST.

With Shafts and Brake, Sarven Patent Wheel, 1¼ inch axle	$240.00
With Pole and Brake, Patent Wheel, 1¼ inch axle	250.00

A complete description of all our Manufactures cannot be given in the space here allotted, nor in any reasonable newspaper space ordinarily used for Advertising; therefore we invite correspondence, that we may send Circulars and Descriptive Lists. Merchants and Farmers are invited to visit our Works and examine for themselves. It is our aim to excel all in our line of Manufacture in producing not only the best wagons but the best Implements with all the Latest Practical Improvements which are peculiarly adapted to the requirements of our soil, and the Pacific Coast, both in tilling the ground and harvesting the grain; producing articles which combine all that genius, enterprise and practical experience can insure. A guarantee to the purchaser and a credit to the Manufacturer.

Those desiring to visit the Works, can leave San Francisco at 8 A. M. and reach *our station*—Mail Dock—at 9:40 A. M., and return via ferry to Martinez, at 11 M.; by rail, at 5:46 P. M., and reach Benicia at 5:30 P. M., or leave San Francisco at 4:30 P. M. and reach Mail Dock at 6:40 P. M. Trains from Sacramento reach Works at 8:10 and 9:40 A. M. and 5:45 P. M. Trains leaving San Francisco at 8 A. M. and 4:30 P. M., also those arriving from Sacramento at 8:10 A. M. and 5.45 P. M., will stop at Mail Dock by notifying the conductor. All the river steamboats stop at our wharf. Shipments made should be marked "B. A. W., Mail Dock, Benicia."

Address Manufacturers

BENICIA AGRICULTURAL WORKS, Benicia Cal.

Or Agents, **BAKER & HAMILTON, San Francisco and Sacramento.**

MINING AND SCIENTIFIC PRESS.

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VOLUME XLIV Number 25

Improvements in Underground Surveying.

[Written for the PRESS by LUTHER WAGONER.]

In an nndergronnd snrvey, where great precision is reqnired, the chief difficnlty is generally in measnring the angles, and this trouhle is augmented with the shortness of the sights. Usually a plnmmet is snspended from a nail driven in the timbering, or a plug inaerted in a drill hole; a point is taken on the gronnd and the instrnment is aet over the point, and the angle measnred in the nsnal manner. Several sources of error are here introdnced: 1. The difficnlty of suspending a plumh-line from a nail with a triangular notch in it, so as to occnpy exactly the same place each time—nsually a small variation occnrs; 2. Eccentricity of the point of the plnmmet; 3. Air currents deflecting the plummet from its normal position; 4. Error of marking the precise point of plummet; 5. Error of plumhing transit over point; 6. Difficnlty of setting instrument over the point in rocky gronnd and want of firmness, preventing repetition of angles and manipnlation of instrnment; 7. Want of space to move around instrument; 8. A possihle error of line of collimation not passing throngh the center of the instrument can be eliminated by reversion. To overcome these difficulties, the following-desorihed apparatus was devised and used for the location of the Garfield shaft, New Almaden quicksilver mine, California. The locat'on of this shaft requirsd a snrface line 3,500′, rising 800′ over the mountain, and a tunnel line of 3,700′, having 10 angles, the third conrse having a length of 40′.

Fig. 1 of the engravings showa the general arrangement devised, and which may briefly be described as a system of setting up nearly under the station, and afterwards determining the amonnt and direction of eccentricity of instrnment. For this purpose a small mirror, *j*, Fig. 1, having a scale graduated to .005 foot, was secured by a thumb-screw to the top of the transit. To adjust it, the telescope was directed to a lamp, and the thumb-screw being loosened, the mirror was turned right or left until the observer's eye, distant about two feet, and its reflected image pointed towards the lamp. The mirror is then made fast. It is not necessary that a perpendicular to the mirror should be parallel with the line of collimation, but it is convenient, and as the eccentricity is generally less than .01 foot, great accuracy is not necessary.

Fig. 2 (see engraving on page 417) shows the application of the mirror. In this example the plumb line is at B, and the instrument at O; the eccentricity is .03 foot and its direction is 60° to the right from station A.

If the instrument was exactly nnder the plummet, it is plain that the reading of the reflected plumb-line would he oonstant for all direotions of sight. In this case the instrument is slowly revolved until the minimum reading of the refleoted line npon the acale is found to be 0.024; and 180° more, the maximum is found to be 0.084; the msan is 0 054, and upon turning the telescope until this reading is given. the angle of eccsntricity. AOB., is seen to he 60°, and its amonnt is 0.084—0.024÷2=0.030. To reduce the measured angle to center, the diagram. Fig 3, is employed; entering it on the left at 30° and .030, we have 0 026, or .030×Sin. 60°; on the bottom line of distances for 28 ft. and .020; the diagonal line followed out gives 19″.2 as the correction for this side. The diagram oan he also entered at 28×5=140; following ont .026 over 140 we find 3″.85, and this multiplied by 5 gives 19″ 2, the correction; for the angle BCO we have .030×Sin 90°=.030 and 26 ft. This gives 23″.8, and 19″.2+23″.8=43″, which, suh tracted from the measured angle, leaves 150° 01′ 11″ as the corrected result.

In this system the plumb-lines, about 18 inches long, are suspended, and are not removed or touohed until the work is finished. Where the distance is greater than the plumh-line can he seen, small strips of white paper, like *i*, Fig. 1, are strung on the plumb-line and illuminated with a coal-oil lamp or bull's-eye lantern.

To support the transit firmly and allow sufficient space to manipulate the same, the wrought-iron gas pipe snpport, Fig. 1, was devised. When the screw is run in it is 5′ 4″ over all, and rnn out it is 6′ 7″. Its arrangement is snch that it can be set in any position, and it was found to possess enormous rigidity, as compared with the tripod, as shown in the Fig. 1. It could be shook hack and forth at *f*, with a force of 40 lbs., withont permanently changing the cross-wires from a fixed mark. A slide rest, auch as is used for small lathes, could he attached to *f*, and would make a valnahle addition to the support, especially for taking direotion from plnmb-lines swung in the shaft.

With this apparatus, sights as short as oan be read with the telescope can he introduoed, and the angles measnred with extreme precision.

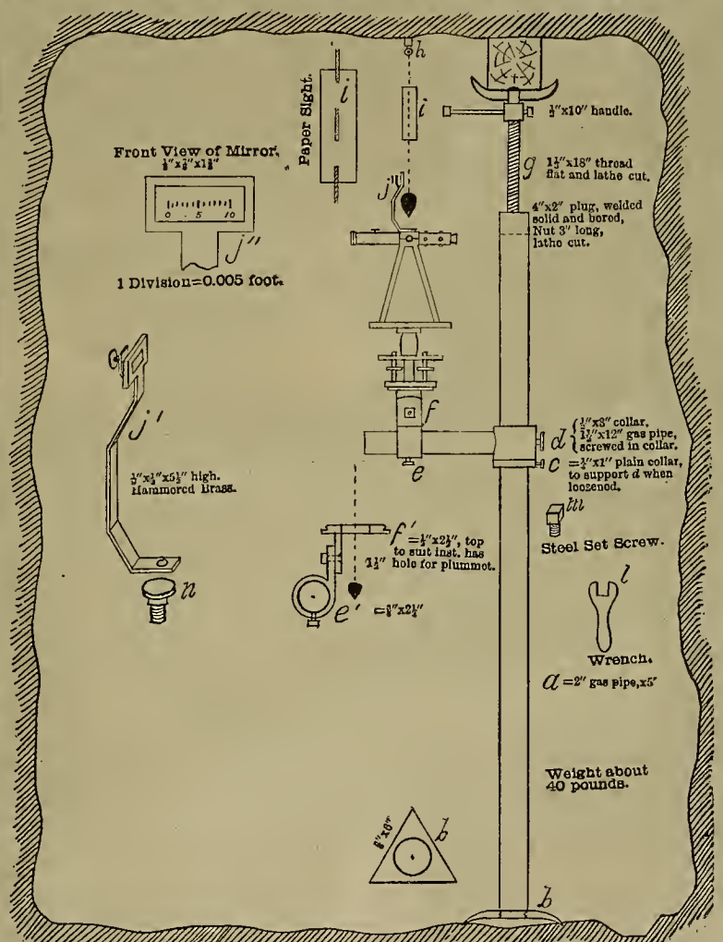
Front View of Mirror.
1″x½″x1⅛″
1 Division=0.005 foot.
Paper Sight.
½″x10″ handle.
1½″x18″ thread flat and lathe cut.
4″x2″ plug, welded solid and bored, Nut 3″ long, lathe cut.
½″x3″ collar.
1½″x12″ gas pipe, screwed in collar.
=½″x1″ plain collar, to support d when loosened.
Steel Set Screw.
Wrench.
=2″ gas pipe,x5′
Weight about 40 pounds.
½″x½″x5½″ high. Hammered Brass.
=½″x2½″, top to suit inst. has 1½″ hole for plummet.
=⅜″x2½″

FIG. 1—WAGONER'S JACKSCREW STAND WITH MIRROR AND SCALE FOR TRANSIT, AS USED IN THE NEW ALMADEN MINE.

MINES NEAR OROVILLE.—The Minerva Gold and Silver mining company's mine and mill are situated five miles northwest of Oroville, Butte county. The mill consists of four Huntington batteries and three amalgamators. It is about 500 ft. from the month of the tunnel of the mine, and the main length of the tunnel is 600 ft. The tunnel has four wings, the longest heing about 100 ft. and the shortest 50 ft. The ore is mostly of a sulphuret nature, and pays about $16 per ton. The mill and mine are owned hy W. E. Duncan, and are under the snpervision of Mr. C. H. Chick. The Banner mine is situated ahont one-eighth of a mile above the Minerva, and is one of the best equipped mines in the State, having the latest improved hoisting machinery. The shaft ia down abont 200 ft. At present the mill is not running.

Death of W. B. Hyde.

Col. W. B. Hyde, of Oakland, died snddenly at Custer, Idaho, this week. After spending the winter with his family in Oakland, he had only lately returned to the sosne of his labors at the General Custer mine and mill, the flonrishing property which he was ably managing, and in which he was largely interested. Col. Hyde was a well-known civil engineer, snd was for many years in the employment of the Central Pacific railroad company. He was an ingenious inventor, and ohtained many patents from the Government. For many years he devoted his attention to the problem of atsam plowing, and was as well posted on that subject as any man in America. Hs informed the writer not long since that he intended publishing a work on the snbjeot. He invented a system of operating dry-docks hy hydranlio method, and also had turned his attention largely in the direction of ice manufaoture. The water supply of San Francisco was another subject to which he had given careful study. Col. Hyde was an ardent student, and went to the bottom of any snhjsct which he nndertook or in which he hscame interested. He possessed a mass of general information seldom grasped by men of his age. His mind was intensely analytioal, and always strove for reasons as well as for general resnlts. A brilliant conversationalist, genial companion, tenderly loving father and husband, he will he sadly missed hy not only his immediate family, but a large circle of friends and acquaintances. His ahility was recognized by all with whom he came in contact, and made him able to grasp oomprehensively the details of what he nndertook, so as to carry it to a successful issne. Within the past few years he has devoted himself to mining, and bronght the property with which he was connected to high standing and great pecuniary snccess. It is sad that a life so full of promise should have been cut ao suddenly short. Col. Hyde was a member of the Society of Enginsers, and a life-member of the California Academy of Sciences.

Placer County Quartz Mines.

During the last six months the energetic prosecntion of work on two quartz ledges, known and prospected to some extent for several years, has developed two mining properties which will undoubtedly remove, in part at least, the clond nnder which qnartz mining in the vicinity of Auhnrn and Ophir haa lain for the last six or seven years.

The owners of the Gold Blossom qnartz mine, sitnated on Crater hill, ahout one mile west of Ophir, have had stoped several hundred tons of qnartz from gronnd opened up by their shaft and levels. The average of the rock is of an excellent quality, carrying a very high percentage of rich sulphnrets; and in the stopes just referred to a chimney of ore, oonsisting of an almost solid mixtnre of iron and copper pyrites and galena, and containing a large amonnt of coarse free gold, has heen strnck. This ore assays np into the thousands per ton. They have also just finished the construction of a mill for the ore from this mine. Owing to the condition of the gold in the ore, being almost entirely in the snlphurets, the usual form of mill used for the treatment of gold-bearing quartz has not heen put up, the process and mill employed being as follows: The ore, after being broken by a crusher, is reduced to a powder by a Tustin pulverizer; then sized hy screens, the finer material, containing a high percentage of snlphurets, going directly to the chlorination plant, and the coarse to ooncentrators, which separate the sulphnrets from the gangne. This latter is not thrown aside as waste, hut, together with quartz from the mine considered too poor in sulpburets to he treated as above, is first run through a ten-stamp mill. It it expected to save and treat hy chlorination a mnch larger percentage of sulphnrets than is practicahle by the usual method of mill, and thus reducing the loss of gold in tailings to a minimum.

The other property referred to at the commencement of this article is the Belmont quartz mine, situated two miles northwest of the Gold Blossom. The ledge is very large, outcropping from 10 to 15 ft. ahove the surface, and about 6 ft. in thickness. About six months since, Wm. Werry, for many years engaged in quartz mining areund Ophir, acquired control of the mine. A shaft had been sunk hy the former owner, and from it ore taken claimed to have milled $40 per ton. This shaft was cleaned out and continued to a depth of 170 ft., at 75 ft. levels run 100 ft., and at 150 ft., run 150 ft., opening np the vein in both directions from the shaft. The course of the ledge is northeast and southwest, and the dip nearly vertical. The thickness of the ledge is nowhere less than 3½ ft., and varies from that to abont 7 ft., the average increasing, as far as observahle, with dspth. The ore is free milling. Ahout 300 tons on the dnmp, taken from the shaft and levels, by numerous samples worked by mill process gave results per ton varying from $25 to $80 in hnllion worth abont $12 per ounce. From these tests it is estimatsd that the ore on the dump and in sight in the mine will yisld abont $20 per ton. This propsrty, giving every promise of heing extremely rioh and permanent. was purohased a short time since by G. W. Grayson—the first investment made in that looality by a San Francisco capitalist for several years.

A NEW mill is to he erected in Homer district for reducing ore from the Nioma mine.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

The Hydraulic Mining Question.

EDITORS PRESS:—At last Judge Temple has rendered hie decree, and the significant word *enjoined* is upon everybody'e lips. One announcement reads: "Judge Temple makes the injunction in the Gold Gold Run case perpetual." "The conclusions of law found hy the court are againat the hydraulic miners." The infereuce naturally to be drawn from such a rendering is, therefore, that the miners have no redress, so as to enable them to prosecute their work successfully, except hy appeal to the Supreme Court, and awaiting that decision. Meanwhile great industriee and industrious workers may he paralyzed, for the practical or virtual ehutting down of mines largely affects manufactures, as well as cuts off the bread supplies from thousands of homes, and re-plants chaparral where pears and peaches were flourishing. Nay, worse—recalls the coyote and the wolf and the hear, where domeetic fowls, and the lamb and the cow had yielded their first-born for the sustenance of men, and yet were more ahundant annually. "Peace reigned within the homes of the workers, and plenteousness filled their palaces," for wherever nome is, and the wherewithal, and contented minds, and happy hearts, cheerful workers are as proud of such homes as though they were castles or palaces—and every man's home ie his castle—except, perhaps, in unhappy Ireland. And yet upon what tennre is a California home, where the laws are so constituted that although he has paid *Uncle Sam for a patent forever for his mine and homestead*, and he goes on to work that mine according to usage, which, as a primary necessity, requires water and a dumping ground, he is, nevertheless, practically barred from the use of either by the decision of a court, which virtually lays down the principle that everything we find in nature is to he left intect for him that may come after you, or the equivalent—don't use the rivers, however necessary. There seems something plausible in euch a creed and such a judgment, and some of us deceive ourselves into the idea that it is "doing unto others as we would he done by." But it is not; neither is it the law of God, "by whom and for whom all things were made." That great and glorious being who made all things for Himself, nevertheless, when He created man, said: "Let us make him in Our image. Let him have dominion over everything; let nothing remain intect, and to him they shall he for meat and for drink"—that is to say, not only every living thing ehell be at man's command, as they had been at God's command, and we know that it is practicelly eo, even every time we visit a menagerie, for we there have evidence direct, that man can make the lion to lie down with the lamh; and every man who is a man thinks and feels that God-like instinct or will within him. which leads him on to diecover properties and uees and names for the whole cahinet of God's creation, without and within the bowels of the earth. Whence are these promptings. if not from above? What is it makes man honored and may hand his name down to future generatione as a benefactor to his rece but discovery? In other words, the unravelling of God's laws and interpreting them to men. Aye, and even the artist does this with his little quilled eable pencil, and portrays divinely, with means that the savage never could have found such a use for, through a little manipulation, almost a *fac simile*, pictorially at least, of one of the grandest works of God—the Yosemite. Painting is God's law interpreted. The photographer elicits a greater marvel. He weds chemistry and light, and in an instant reveals the image of a heloved mother, as a perpetual gift to a fond son or daughter; or the latter, perhaps, who is about to leave home, possibly with her wedded spouse, and offers this tender and loving tribute to her revered perent, that she may gaze upon, and almost recall the living presence with joy, and yet with tears, for still the silence of the picture writes down, "parted." But almost more wouderful etill, the telephonist brings hack her well-known voice into her very chamber—"Mother, dear, bahy is horn." Thus, it is clearly God's will that we should go on, and on, interpreting laws that He himself has laid down. And not only eo, but commanded him to follow "with the eweat of his hrow," and then "it shall be for meat and drink to hiu." Thus it matters not what vocation we select, "there is work for all in God's vineyard," and we shall he "unprofitahle servants," if we do not pursue the hent of our calling. God and nature never impose any restriction to the successful working of our vocations. Every kind of vocation virtually enjoys its own commonwealth everywhere, and is pureued according to the best means of pursuing it, or according to the best-known means of pursuing it. If a man does that, he cannot, upon any principle of equity, he called to account for treepassing upon the rights of others, for others can have no rights which hinder another from diligently pureuing hie vocation, according to the hest meane known. There are rights, however, that are superior to other rights, just as they rise higher and higher in science, or are paramount to the general commonwealth. Thus, no matter what description of property a man may have, if the commonwealth demands a railway or an acqueduct, or even a puhlic road to he made through that domain, it must give place to the general improvement. It ie a speciee of property that has inferior righte to uthere, and ie so regarded and valued. So, if a man own ill-conditioned property in a city where a new thoroughfare is deemed more desirable, he muet sell out for the public improvement; and whereie the difference, if a man owns a farm which either stande in the way of a far more profitahle mine being worked, which is a ecientific undertaking, or if worked according to usage of the hest means known, still unavoidably causes injury to a part, at leest, of said farm, and society does not make laws for individuals so much as for the people collectively; such property mey experience some damage compared with the present standard of value, hut it enhances the value of other property not subject to the same damage, because it makes such property scarcer and more in demand. The way to get even would he, to acquire an interest in each of these kinds of property, and nature and society have no pity for a man who risks his all upon one die. Even the merchant would he mad to own but one ship, and have no means of insuring that or ite cargo. He must take the consequences, if disaster arises. But the merchant who has a fleet of ships makes his profits upon the aggregate, although he experiences losses. So, if a man has put all his means into a farm which a river may wash out, he takes a desperate venture, for the sake of chances of reward out of real proportion to the mean value of the ranch. Perhaps he does well for a time, and if he is saving he may be able to levee againet disaster, or huy a better place later, or perhaps he becomes part owner in the mine that unavoidably causes him damage. The probability is, anyhow, that the mine owner ie willing to compromise with him and pay him for all reasonable damages he may have now sustained. But the mine owner ought not to he estopped from following a higher class of undertaking than the farmer is engaged in—an undertaking that the Government puts at an enhanced value, hy rating the lands at an enhauced value from the very first. Again, it is absolutely criminal for a man to maim or injure another man bodily; and yet, if a man has sustained a bodily injury through acoident or otherwise, another man who understands maiming scientifically—a eurgeou—is called in requisition and paid handsomely for his services. There are laws, therefore, which override other laws. The lesser must give way to the greater. Science asserts her own superiority over mere labor, and science has ite proportionate right of exercise. God and nature have estahlished no such principle as enjoining, excepting in the Ten Commandments, which are definite, and none of which apply to estopping a valuable industry. Now, then, if man makes laws which are not warranted hy the divine law, and in pretended espousal uf right, he is a liar, or, as Scripture eays, he maketh God a liar, and ie working against the providence of God. The honorahle judge who enjoins tbe Gold Run mine, therefore, is making a decree upon a false assnmption, for the rights of man du not warrant the estoppel. The honorable judge doubtless has no intention of eetopping the right of man, and his ruling, perhaps, arises from a misconception of right and wrong, and the logical conclnsione that are due to the necessities of the case, for it would eeem as though the application of the plaintiff—that an enjoinder should rest—was founded in error, and the application should have been simply for equitahle damages. The defendant ought, therefore, to he entitled to a verdict as against the plaintiff for error in procedure, and au appeal he taken to the Supreme Court upon this point, to sustain this view, when the Supreme Court may, thereupon, order a new trial. But the rendering of Judge Temple is not, in fact, final; for, by its own definition, it dismisses the complaint that the defendant had no right to throw its tailings into the American river. On the contrary, it confirms said right within certain limits—limits defined by Judge Temple himself—to wit, said American river ahove Alder creek. The question arises, upon tbis, had Judge Temple any such diecretionary power uf hsing his own arhiter of what constituted lawful or unlawful distsancs? If he had not euch power, then his waiving the objection to using the American river at all for dumping ground waives the whole question, for if he could see no legal objection to the defendant's so using the river, theu he was bouud in equity to nonsuit the plaintiff, and give a verdict for the defendant; hence Judge Temple ie prohahly in error in that ruling, likewise, which is a eecond ground for appeal to the Supreme Court. The upshot may be, however, that "the defendant may at any time," or now, therefore, apply to the court Judge Temple presided over; and the decree empowers to have the decree vacated, because of its insufficient grounds of adjudication; or, if miners prefer, they may possibly he ahle to confine themselves within the text of the permission to throw euch tailings into the river, and retain them above Alder creek. It may be noticed in the deoree that the right of applyiug to the court to vacate the decree does not depend, however, upon firet impounding and detaining the tailinge above Alder creek. It may be noticed, further, that the word retain is not ueed in the decree. "Efficient means to detain" may not mean more than doing the heet they can, although absolute retention may not transpire. Lighter sand is permissible, so that the whole vexed question of slickens is not prohihited, or even suhject to damages. Perhaps, therefore, the miners can get along with the decision very well. The remaining question, however, of who shall fuot the bill, may, perhaps, be demurred to; for, if the minere have done no legal wrong and were entitled to a verdict, then, of course, the complainants ought to he compelled to pay coste. That is another point, therefore, fur the Supreme Court to decide, if not even for the Superior Court, with another judge presiding, under the permiesion granted to apply for a vacating order of the decree at any time. Upon the merite of the rendering, however, if the miners go on throwing their debrie into the river, and some cohhles get pest Alder creek, who shall deoide whose they are? or who put them there? Now, then, suppose a boy, out of pure mischief, finds some cohhles higher up, and every day picks np one or two and puts them helow Alder creek. Ie the Gold Run mining company responsible for that urchin's malice? Or, eupposing eome farmer, for pure deviltry, or in the pay of some of the learned counsl (if such a thing were poseihle; no perseonal reflections intended) for the prosecution, were to cause such cohble-stones to he transported helow Alder creek, can the Gold Run mining company prevent it? If they are allowed to dump it into the river at all, they cannot be expected to put it under lock and key. So who is to take the consequences of subsequent events, or who is tu determine whether said cobbles did not roll down from the adjoining cliffs?

Upon the whole, the Gold Run enjoinder is pretty full of loop-holes, and I don't know but what the minere may regard it rather as a victory than not. Perhaps already many of them are crying, "Oh, he joyful!" But the most aggravating feature in the case is, the perpetual recurrence to law it must inevitably entail. Of course, that is "Oh, be joyful!" to the lawyers, but ae unwelcome to others as Jarndice ve. Jarndice. There is, in fact, nothing in the decision to prevent the miners from continuing to use the rivers as dumping grounds. The license for all coarser material as far as Alder creek removes all difficulty.

A SACRAMENTAN.

Sacramento, June 13, 1882.

P. S.—If prize essays are in order, I hope the merits of mine will be duly coneidered. Who knows the amount of grief I may assuage hy showing how much "honey there may be in the lion's mouth" of Judge Temple's enjoinder?

Nevada County Notes.

EDITORS PRESS:—For the third year, I am spending the summer months on the divide between Bear river and Steep Hollow oreek in the county of Nevada. I am boarding at the residence of Mr. Frank T. Maguire, who is an old California pioneer. Early in 1850, Mr. Maguire was a mining partner of Mr. W. B. Ewer, of the RURAL, at Nevada City; and he was one of the owners of a hay yard in Sacramento, before the great fire of 1851. In 1852 he commenced mining in Steep Hollow creek, near Lowell Hill, where he was successful in making a raise of the golden metal; and, in 1864, he bought the possessory right of an improved quarter esction of land, between Liberty Hill and Lowell Hill, where he has resided for 18 years, cultivating his ranch and looking after his mining intereets.

Mr. Maguire has an elegant residence, which is built of pine and spruce, rustic outside, sugar-pine ceiling inside, and thoroughly covered, inside and out, with the celebrated Pacific ruhber white paint. His harns and out-houses are large and commodious. He hae 60 acree under a substantial cedar rail-fence, and 10 ecres under a cedar post and picket fence. He has a fine urchard of apple, pear, plum, peach and quince trees. He cultivates the etrawhsrry, raspberry, blackberry and grapevine. He has horses, cows, hoge and poultry. He raises alfalfa, red clover and potatoes. Of the 60 acres under rail fence, at least 40 acres are ewale or natural meadow land, producing a great yield of succulent grass for hay and pasturage. This ranch has unrivaled faoilities for irrigation. At the head of the valley there is a number of large springs, which furnish at least 20 inches uf pure, clear, cold water throughout the year. A portion of this water is oonducted by a ditch and flume into an immense framed tank commanding the cultivated grounds, where the warm raye of the eummer sun prepare it for irrigation.

There are three other orchards and ranches in this vicinity. Oue is owned by Hon. Jere Levee; a second by Mr. Wm. Wilkinson, and a third one by Mr. Chas. Eastin, at Lowell Hill. I have very carefully examined the orchards of Messrs. Maguire, Levee and Wilkinson, and their apple, pear, plum, cherry and quince trees appear to be in a perfectly healthy condition. There is ae much fruit formed as the trees can possibly carry to ripeness. The late and severe frosts, which were so destructive to young frnit in Trinity, Shasta, Napa, Contra Costa, Monterey, Ssn Luie Obiepo, and other counties, only caught the peach treee here, ae the other varietiee of treee were later in hloesom. There will aleo he great crope of etrawberriee, raepberriee and blackherriee. The gooeeberry growe wild all over thie divide; hence, I do not eee it cultivated in gardene; but I have noticed it by the side of the wagon road, along the mountain traile and through the woods. It is as common as the rattlesnake, hut not half as dangerous. The numerous hoge running at large all eummer feed and grow fat on wild herries, roots and acorns. They also root out snake holes with abundant success.

In November of eacb year, Messrs. Maguire and Levee send their cowe and young cattle down to ranches in the lower foothills for the winter, and then drive them hack in May for their summer range. Only a few milch oowe and saddle horses are wintered up here, as the snow usually falls from four to eight feet deep, and unly trails are kept open. Boye and girle have lote of fun in sliding down bill on enow-shoes.

The next question to be considered is, the profit of these mountain ranches. I will draw from the figuree of 1881, as they are a sample of previous years. In November Mr. Maguire sold his apple crop in hulk at the ranch at $50 per ton, to the merchant at Lowell Hill, the buyer finding hie own sacks and hoxes. He also sold several tons of potatoes, at the same price per ton, and in the same manner. When he delivered potatoes to boarding-houses and miners in small luts, his price was $3 per cental. Mr. Levee sold hie apples at $2 and $2.50 per cental, and bie potatoes at $2.50 per cental, oash on delivery. Mr. Wilkinson sold his last lot of apples, in May, at $4 per cental, or $2.50 per hox of 60 lbs., delivered at the C. P. R. R. at Dutch Flat. Not a pound of apples can now be purohased on the divide. But Mr. Levee is holding a few hoxes of Nickajeoks, Limbertwigs, Newtown Pippine, Spitzenbergs, Mock's Late and White Winter Pearmains, to test the relative merits and qualities of the latest winter apples. Hia calling friends may enjoy the toothsomeness of the best fruit in the State; but be has no more to sell of the orop of 1881.

Potatoes yield six tons per acre, when they are properly planted with well-rotted manure and carefully irrigated. Hence, an acre of potatoee is worth in bulk or at retail $300@$360 cash. Some partiee here think that they can raise eight tons to the acre, but I have not seen it done. The varieties of potatoes cultivated are the Early Rose, Early Goodrich, Peerless, White, Neshannock and tbe Selt Lake potato. Strawberriee sell at 8 lbs. for $1; garden vegetables at from 2 cts. to 3 cts. per pound; milk at 40 cts. per gallon; fresh butter at 50 cts. per pound; fresh eggs at 40 cte. to 50 cts per dozen. Alfalfa hay is worth $25 per ton; each aore of alfalfa is worth $125, at five tons per acre for three outtings. Mr. Maguire's place is 4,050 ft. above tide water, as measured by instruments, and Lowell Hill is 50 ft. higher. Mr. Eastin'e apple trees were planted 20 yeare ago, and Mr. Maguire'e 24 years. The other orchards are only some 12 years old.

The geological formation is slate bed-rock from Grass Valley up to Little Bear valley, and the elevation is from nearly 2,500 ft. to 4,500 ft.; hence, this helt of oak, pine, cedar, spruce and tamareck, is the natural home of the apple, pear, plum, cherry, gooseberry and hluc-blaok raspberry. The people of the valleys may have the orange, lemon, fig, olive and their nasty alkali water, with their scorching north winds, in full welcome; but give us the climate, eoil and fruits, uf the higher hills, where the snow falle every winter and where the pure cold spring water gushes out of the mountain side. Up here, robust hoys and healthy girls aro reered; and here, also, they are educated in good puhlio schools.

THOS. S. MYRICK.

Lowell Hill, June 5, 1882.

A RARE CURIOSITY.—According to the Utica (N. Y.) *Observer*, Mr. F. B. Morse, of that city, has in his possession a carefully preserved specimen uf a mermaid, captured by him while hathing on the Chinese coast. The animal is a singular looking object, the head, shouldere and forward portion of the hody, including a pair of arms, bearing a striking resemblance to the human form, while the remainder is like a fish, with the usual fine and tail. The head was covered with hair when the animal was captured. It was taken alive while lazily swimming among some beautiful coral formations in ehallow water, but it only lived two or three hours in captivity, and the body was preserved by a Chinese process. It measured two feet and fonr inches when alive, but its length haa shrunk to 21 inches.

THE Czar desires to appease the people, and has decided to grant reforms. A manifesto will shortly be issued, statiug that the Czar desires to celebrate his coronation hy granting reforms, but is compelled to postpone the ceremony for a year, because of the impossihility of completing the preparations earlier. Two commissione will be instituted to consider questiona of central institutions and share in the admiuistration to he given the people.

THERE has been a fair average catoh of seals on Neah Bay and Quilleute, W. T., thie season, bnt owing to the advance in oost of catching, and the decline in value in foreign markets, the seasons' bnsiness, on the whole, hse heen unprofitable.

THE JUTE FACTORY.—The State prieon jute factory ie now turning out 6,500 yards of burlap daily. There are 400 convicte employed in its manufacture, who are learning eo rapidly that Warden Ames will eoon be ahle to dispense with free lahor.

MECHANICAL PROGRESS.

Mixing and Applying Paints.

The composition nf paints should be governed by the nature of the material to be painted. Thus the paints respectively heet adapted for painting wood anl iron differ considerably. The kind of surface to be covered, *i. e.*, a porous surface requires more oil than one that is impervious. The natnre and appearance of the work to be done—delicata tinta reqnire colorless oil; a flatted surface must he painted without oil, which gives gloss to a shining snrface. Again, paint ueed for surfaces intended to be varnished mnst contain a minimnm nf oil. The olimate, and the degree of exposure to which the werk will he snbjected; thue, for outeide work boiled oil is nsed, because it weathers hetter than raw oil. Turpentine is avoided as much as possible, because it evaporates and does not last; if, bowever, the work is to be expoecd to the snn, tnrpentine is neceesary to prevent the paint from hlistering. The skill of the painter aleo effects the composition; a good workman oan lay on even coats with a emaller quantity of oil and turpentine than a man who is unskillful; extra turpentine eepecially, is often addcd to save lahor. The qnality of the materials nften makes an important difference in the proportions nsed. Thus, more oil and turpentine will combine with pure, than with impure white lead; thick nil mnst be ueed in greater quantity than thin oil. When paint ie pnrchased ready ground in oil, a soft paete will require less turpentine and oil for thinning than a thick paste. Lastly, the different coats of paint vary in their com. poeition; the first coat laid on to new work requiree a good deal of oil to soak into the material; on old work, the first coat reqnires turpentine to make it adhere; the intermediate coats contain a proportion of turpentine to make them work smoothly, and to the final coats the coloring materials are added, the remainder of the ingrediente heing varied ae already described, according as the snrface is to he glosey or flatted.

The exact proportion of the ingredients to he nsed in mixing painte varies according to their qnality, the natnre of the work required, the climate, and other conaiderations. The composition of the paint for tbe different ocate aleo differs considerahly.

The area which a given quantity of paint will cover depends upon the nature of the surface to whiob it is applied, the proportion of the ingredients and the state of the weather. When the work is required to dry quickly, more turpentine is added to all the coats.

In repainting old work, two coats are generally reqnired, the old painting heing considered as priming. Sometimes another coat may be deemed necessary.

For old outside work exposed to the snn, and in cold weather, more turpentine should be used to make the paint flow freely.

All priming shonld he ruhhed out as far as poseihle, for if it is flowed nut loosely or laid on thick, it will be apt to hlieter and rnn. In priming over spots, however, where patching is heing done, it may sometimes be necessary to leave the coat thick or heavy, for new work can never he re-touched and look well after the work is second coated or finished; for snch retouching would ehow and spoil the whole work. In priming, the paint should flow easily, and the hrneh should be pressed on to tbe wood so that the paint will he forced into the pores. In all cases it is a great saving of time to cover ae large a surface as convenient before smoothing or finiehing off. All work on the same surface should he finished at the one application, if possihle, for "lape"—which form the jnnctions of work done at diffsrent times—should he avoided wherever they can, as they are sure to disfigure the work where they exist. Of course, it ie sometimes impossihle to avoid lape, hut where they must occur, care ehould he taken to make the connection with as little "lap" as possihle, or it will be certain to show throngh the work when finished. The defect, if occurring during the second coating, will show much worse than in the priming coat.

In painting, like everything elee, a system must he followed to make much headway. Experience, perhape, is the only effective teacher in this matter; and any rulee laid down hy ue will have hut little effect, if the operator does not, or can not syetematize. The workman who followe a eystem will do nearly twice as much work with less labor as the man who works only hy the rule of thumh. In painting hlinde, lattices, railinge, cut hrackets or other similar work, eome method of operation ehould he adopted. A little observation on the part of the operator will soon teach him the best methods to adopt in doiug any particular kind of work. We copy the above from a little work just puhliehed in New York, and entitled "Hints for Painters, Decorators and Paper Hangers."

THE USE OF ALLOYS.—The opinion seems to he rapidly gaining ground among metallurgiete that, wherever mechanical etrength ie desirahle, an alloy ie preferable to pure metal. One of the greatest obstructions to the mechanical value of iron ie ite tendency to cryetallize. Whether the article he a moneter gun or a ship'e cahle, tbe result is the same. But the tendenoy of iron thue to cryetallize may be prevented hy the admixture of other metale. In almost every direction natnre has placed certain metallic masses, to which the name "meteoric iron" has heen given, on the enpposition that these matters have fallen from the atmosphere, the composition of thie eubetance, wherever found, heing ohiefly of iron and nickel, the latter varying from 2% to 10%, with small qnantities of cohalt, and, it is said, chrominm. Science has made artificial meteoric iron, and tests ehow its qualities to he identical with those of the native compound. But in addition to this, it ie more dnctile and hae more tenacity than pnre iron. A mixture of 98 parts purc iron and two of nickel hae all of the peculiarities of the beat meteoric iron.—*Blacksmith and Wheelwright.*

Hardening Steel.

The effect of occluded gaees in iron and steel, says *Engineering*, is now being carefully studied hy metallurgists in general, and a committee of the Institution of Mechanical Engineers recently raieed the question in one of its reporte as to whether the hardening and tempering of iron and steel might not be produced hy the expulsion of ocolnded gaees during the heating process and their snhsequent exclusion hy the sudden cooling and contraction. Prof. Chandler Roherts has undertaken to anewer this question, and hy heating rods and steel in vacuo by means of the electric current, and suddenly quenching them in ccol mercury, he demonstrates that steel will harden when there are no gases to ahsorb. The metal was, of coursé, rohhed of its occluded gases hy means of an air pump connected with the vacunm chamher, and the parte which were quenched in the mercury were found to he glase-hard, while those which did not reaoh the cold fluid were found to he quite soft. Prof. Roherte, therefore, conclnded that gases do not play any part in the process of hardening and tempering. Prof. Hughes, who hae made numerons experiments on the subject, helieves that the temper of eteel is due to the chemical union of the iron with the carbon. At low temperature thie union takes place only in a slight degree, and hence in soft steel we have the carhon keeping aloof from the iron; hnt as the temperatnre is raieed the comhination ie furthered, until, in the caee of gray or hard steel, we have really a kind of diamond alloyed with iron. Sudden cooling ie neceseary to fix the comhination, for in elow cooling the carhon eeparates from the iron. Thie tbeory ie a very promieing one, and is eupported hy a variety of faote, Mr. Stroh, for example, having observed that when an electric spark passee hetween two iron contact pieces and fuees them, the fused part gets diamond hard and will ecratch a file.

Riveting.

In a report on riveting in locomotive hoiler work, made hy a committee of the American Master Car Builders' Association, ie found the following: The operation of "driving" rivets consists in placing a set on the end of the rivet, and sledging it down to form the head, the operation requiring two men to eledge—one to hold the set, one to manage the holder—and a hoy to heat the rivets. The rivet is not struck direct hy the sledgee at any time dnring the operation of driving, hut the head is formed entirely hy driving the set down equarely on the end of it. To drive a rivet requires about 24 hlows witb the nine-pound or ten-pound sledges, at the rate of about 80 hlows per minute; a flatter, with a face about one and one-half inches square, ie then placed on the lap alongside the rivet, and given five or six hlows to close the eheets together; the set is then placed on the rivet head again, and given five or six more hlows, and the rivet is finished, the whole operation of driving requiring about 35 seconds of time to the rivet. In practice we find that a riveting gang will drive in the seams of the shell of a hoiler an average of 30 rivete per hour, or 300 per day, and in the seams of the fire-hox, in throat and hack sheete, dome, mud ring, hraces, etc., an average of ahout 22 rivete per hour. This includes the time necessary for taking out holts, drifting holes, adjusting the toole and work. In hand riveting, two rivetere will drive, on an average, taking the whole hoiler, only ahout 125 rivets per day, or 12½ per hour.

WATER WHEELS.—There are three ways hy which the power may he ohtained from the falling water, and all water wheele oome under one or the other of these three, viz: hy weight, by pressure, or hy impulse. Which kind ehould he used in any given case must he determined hy circumetances. In no case can any kind of machine he made to yield more power than the amount due to the weight of water and the distance fallen, hut there may he a very large loss, aud one kind of wheel heing eubstituted for auother, frequently diminiehes the loes so much as almost to lead one to helieve that the wheel itself was a eource of power. To diminish the necessary lossee to the smallest amouut poesihle ie the aim of the skillful maker of water wheels, and the differenoe hetween the old-faehioned overehotstraight-float wheel, so often introduced hy paintere in their picturesque landecapes, and one of the modern turhinee, is ahout ae great as hetween a steam engine of tbe last century and an automatio expansion engine of the present day.

AMERICAN agricultural implement makers have heen officially invited to open a epecial correspondence with a certain portion of Rueeia, with the idea of introducing our agricultural machinery there.

SCIENTIFIC PROGRESS.

Important Astronomical Observations.

Intereeting and important resulte are reported from tbe English, French and Italian observers who went to the village of Soham, in lower Egypt, to observe from that point the solar eclipse of the 17th ultimo. The partiee were favored with fine weather, and though the totality of the eclipee continued hut 72 seconds, yet in that extremely short epace of time very much of eoientific interest was acquired.

The firet thing noticed was a small comet very near the sun, which, from ite location, ooald not have heen the one which for eome weeks hae heen attracting the attention of ohoervers all over the world. The comet was photographed, and its pictnre will afford a study of much interest in the future.

The second, and much the most important item of interest, wae the darkening of the lines of the epectrum, as reported hy the French party, giving evidence of a lunar atmosphere. If thie observation is enhstantiated, it will effect a revolution in the direction of lunar physics, and relegate our moon from her hitherto suppoeed state of death and desolation to one of at least comparative life and phyeical activity.

The third item of marked interest is the announcement that the epectrnm of the sum's corona was photographed for the first time. If this waa euccessfully done, we may from this hope for increased knowledge of the constitntion of the sun's magnificent appendage, seen only in a total eclipee, so grandly heantiful ae to make the heholder feel like veiling his eyes in the celestial preeence. The corona, with its silvery light, its epreading wings, its ciroles, arches and curves stretching ont into fathomlese depths around the darkened sun, ie considered as one of the most impressive and awe-inspiring sighte in which celestial majeety and grandeur are ever embodied. Its oonstitnente and office in solar economy are prohleme whose solution is much desired.

According to the *Scientific American*, the Englisb expedition, with Prof. Lockyer as the ohief director, laid ont an organized plan of operations. Some of their points of obeervation were to note if the ahundance and activity of the rosy protuherances gave proof of the present disturhed condition of the sun while passing throngh ite maximum period of snn epots; to compare and detect the difference in the spectra of rosy flames and sun epots; to get an idea of the physics of the solar atmoephere—that ie, to find what it looks like; to etudy—if the expreseion may he used—its circnlatory system; and to determine its chemical nature, especially if the chemical elements exieting in the snn are dissociated or separated hy the intenee temperature exieting there. Special attention is now directed to solar phyeics and chemietry, in consequence of the hold and ingenions theory of Dr. Siemens on the conservation of solar energy.

Photography was greatly relied upon in the solution of these intricate problems, and so much have methods improved in the rapidity with which the image can he impressed on the sensitized plate that seconds will now record more than minutee did 20 years ago. Tho telescope and the epectroecope were combined with the photograph in the attack on tbe sun's surroundings dnring the eclipse.

There is every reaeon to hope for nnusually noteworthy results to he obtained from thie eclipse, observed with the hest aetronomical instrumente the world can furnisb, and with aetronomers of world-wide renown to nee them effectually under the cloudlese sky and in the serene atmosphere of the station on the Nile. We have etill to hear from otber stations on the line of totality, and to wait for fuller details and photographs that will teli ue still more of the good news from the observatione of these scientific parties.

Is the Mediterranean of Recent Origin?

The degree of likeness or unlikeness of the fanna and flora in regione more or less apart, may he found to throw light on changes tbat have occurred in the configuration of land and eea. This line of thought hae lately ongaged the attention of M. Blanchard. In an interesting paper to the Paris Academy he showe, by numerous examples, how the fauna and flora on the extensive coasts of the Mediterranean present the same general character, which disappears at a short dietance from the ocast, where tho ground rises. If the Mediterranean coaets, he saye, were hrought together, the most attentive inveetigator might pass from Europe to Africa, or to Aeia, without any trait of living nature making him aware nf it. Now, ae very moderate obstaclee prevent the dissemination of a large number of animals and plants, it eeems certain that the Mediterranean would he absolutely impaesihle for most speciee.

M. Blanchard infers that the sea has heen formed at a recent epoch, in the midst of a region already inhahited hy the animale and plants now found on its coaet. Recent data as to the marine fauna he regards as confirming this view; for the fauna of the depthe appear to he entirely from the Atlantic. The inland sea must at one time have extended much further eastward, and may have communicated with Arctic waters and with the Indian ocean; it appeare not to have heen in junction with the latter eince the miocene epoch. From tbe geological point of view, M. Danbree was unable to think the Meditorranean of quite recent formation; for there are cretaceous, eocene, and miocene depoeite in the epace it covers. More recently, in pliocene times, the sea exceeded its present shorce, and pliocene deposits are found throughout the extent of the preeent hasin in the numerous islands which rose from the sea at the end of the tertiary epoch.

The Daily Swelling of Plants.

With delicate means of measurement Herr Kraus hae recently proved the existence of a phenomenon in all plant organs, which is connected witb their variahle water-content, snd consists in a periodical swelling and contraction in the 24 hours. Leaves, etc., decrease in thicknees from the early morning till the afternoon, when they hegin to ewell again, attaining a greater size hy night than hy day (this is well eeen in agave, aloe, and the like). Similarly with huds, flowers, green cones, fruits, etc., and with steme and branches. Herr Kaiser had hefore proved such a period in trunks of treee, and Herr Kraus shows that hoth wood and bark ehare in it, independently or unitedly. The various experiments of Herr Kraus—removal of foliage, watering, shutting out light, etc.—lead to explanation of the phenomena hy the varying reciprocal action of those factore which hring water into the plant and those which carry it away. By night only the waterahsorhing activity of the parts helow ground operatee; hy day the water-conenming activity of the parts above ground heeides. The water-consnming activity depends mainly on the foliage and on light (removal of leaves or of light stops the contraction) and consists eseentially in tranepiration. Herr Kraus states that when a plant is watered these things occur: In a short time, lese than an hour, the stem hegins to swell; hoth wood and hark take part in this, the wood always first. The swelling progresses at a pretty quick rate, upward of several meters per second. After some time, perhaps an hour, contraction gradually recurs. The contraction hegan at the upper part of an acacia after 10 minutes, whereae the swelling at the lower part continued 50 minutes. Thie shows that the contraction is due to the activity of the foliage, and is gradually extended downward.

The Resemblances Between Men and Monkeys.

If the skeletons of an orang-outang and a chimpanzee he compared with that of a man, there will he found to be the most wonderfu. resemhlance, together with a very marked diversity. Bone for bone, throughout the whole structure, will he found to agree in general form, position, and function, the only absolnte differences heing that the orang has nine wrist-honee, whereae man and the chimpanzee have hnt eight; and the chimpanzee has thirteen pairs of ribs, whereas the orang, like man, has hut twelve. With these two exceptions, the differences are those of shape, proportion, and direction only, though the resulting differences in the external form and motions are very considerable. The greatest of these are, that the feet of the anthropoid or man-like apee, as well as thoee of all monkeye, are formed like hands, with large opposahle thumhs fitted to graep the hranches of trees, hut unsuitahle for erect walking, while the hands have weak, small thumhs, but very long and powerful fingers, forming a hook rather than a hand, adapted for climhing up trees and suepending the whole weight from horizontal hranches. The almost complete identity of the skeleton, however, and the close eimilarity of the muecles and of all the internal organe, have produced that striking and indicrons resemhlance to man which every one recognizes in theee higher apee, and, in a lese degree, in the whole monkey tribe; the face and features, the motione, attitudes, and gestures heing often a strange caricature of humanity. Let us, then, examine a little more closely in what the resemhlance consists, and how far, and to what extent, theee animals really differ from us.—*Popular Science Monthly.*

PROGRESS OF THE TELEPHONE.—It hegins to look as if the telephone would shortly hecome as formidahle a competitor of the telegraph in the country, as it has already become in tho cities. Arrangements are now heing made to connect a large number of the interior towne of the Western States with the chief cities, like Chicago and St. Louis. For some time large towns near to each other have enjoyed the nse of the telephone, and the eervice haegiven great satiefaction. A new company, with a new telephonic eystem, is spoken of hy the papers. Thie new telephone, eo it is said, can tranemit meeeages more clearly and at longer distances than by the Bell system, and has the circuit so arranged that noñe hut the party to whom the meseage ie sent can hear what is heing said. Additional improvements in the telephone may he expected in the future, and its use ie hound to he greatly enlarged. With its expansion let us hope that the service will he improved and cheapened.—*Industrial World.*

HIGHT OF THE ATMOSPHERE.—Dr. A. Kerher has estimated the hight of the atmoephere from the phenomena of refraction. By two different methods he ohtains hights of 189 and 192.6 kilometere (117.4 and 119.7 miles).—*Wied. Annal.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jun. 1.		Week Ending Jun. 8.		Week Ending Jun. 15.		Week Ending Jun. 22.	
Alpha	25c	....	50c	25c	60c	....	65c	50c
	70c	10c	90c	55c	1.25	52c	1	70c
Alta	45c	35c	50c	40c	35c	30c	45c	30c
Andes	1.70	1.35	2.15	1¼	2.60	1.70	2.75	2
Albion	15c	....	20c	....	30c	20c	25c	20c
Argenta	....	....	....	....	....	....	....	....
Addenda	35c	25c	35c	25c	25c	....	30c	20c
Belcher	....	....	....	....	....	....	55c	10c
Belmont	4.40	3.50	4.90	3.65	4.20	3.95	5	4.35
Best & Belcher	20c	10c	10c	5c	10c	5c	90c	5c
Bullion	15c	....	....	....	15c	....	20c	....
Bechtel	10c	....	10c	5c	25c	15c	25c	....
Belle Isle	5	4.95	5¼	4.90	5⅜	5¼	5¼	5⅛
Bodie	35c	5c	15c	10c	30c	10c	10c	....
Benton	2	1.90	1¼	....	1.95	1⅛	....	....
Bulwer	....	....	....	....	....	....	....	....
Boston	....	....	....	....	....	....	....	5c
Black Hawk	1.20	1.05	1¼	1.20	....	....	1¼	1.20
Bodie Tunnel	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	20c	10c	30c	15c	20c	5c	20c	10c
California	....	....	15c	....	10c	....	20c	....
Challenge	35c	20c	35c	15c	60c	50c	55c	55c
Chollar	50c	....	40c	....	55c	50c	50c	....
Confidence	....	....	....	....	....	....	5c	....
Con Imperial	45c	30c	45c	30c	40c	35c	45c	35c
Con Virginia	40c	....	40c	30c	30c	25c	40c	30c
Crown Point	....	....	....	....	....	....	....	....
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	1	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Cor Pacific	....	....	....	....	....	....	....	....
Deroec	....	....	1.85	1.70	1.80	1.68	1.95	1.85
Day	2	1.95	10c	....	....	....	....	....
E. Mt. Diablo	15c	....	17½	15	10c	....	15½	....
Eureka Con	16	15⅜	....	....	15c	13⅜	15c	10c
Eureka Tunnel	25c	10c	10c	....	15c	10c	15c	10c
Exchequer	15c	10c	....	....	....	....	....	....
Endowment	....	....	20c	15c	25c	20c	25c	23c
Grand Prize	10c	5c	....	....	....	....	15c	10c
Golden Gate	....	....	20c	....	15c	....	1.90	1.60
Goodshaw	25c	20c	2	1.35	1.70	1.40	1.15	85c
Gould & Curry	1.70	1.30	60c	25c	50c	35c	....	....
Hale & Norcross	60c	25c	....	....	....	....	....	....
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	10c	....	25c	5c
Julia	15c	5c	10o	5c	10c	5c	....	....
Justice	....	....	....	....	....	....	....	....
Jackson	....	....	....	....	....	....	35c	....
Jupiter	20c	....	....	....	20c	....	....	....
Kentuck	....	....	....	....	....	....	....	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	3.80	....	3.90	33	4.15	4	4.10	4
Martin White	....	....	....	....	....	....	....	....
McClinton	60c	50c	1¼	50c	1.15	1.0c	1.10	1
Mono	5⅛	4.70	5⅛	5	53	4.90	5⅜	5⅛
Mexican	4¼	....	4¼	....	4.10	4	4¼	4.20
Mt. Diablo	65c	....	....	....	50c	....	60c	....
Mt. Potosi	1	95c	1	1.90	1	95c	1	95c
Noonday	....	....	....	....	....	....	....	....
New York	....	....	....	....	....	....	....	....
Northern Belle	8	7⅛	7¾	....	7⅛	8	8⅜	8¼
North Noonday	90c	70c	85c	75c	90c	80c	85c	80c
Navajo	2¼	2.15	....	....	2.35	2.70	3	2⅜
Occidental	75c	50c	....	....	....	....	....	....
Ophir	3⅛	2.55	2.75	2.45	2.70	2.45	3.80	2⅜
Original Keystone	....	....	....	....	....	....	....	....
Overman	5c	....	25c	....	45c	....	30c	25c
Oro	20c	15c	15c	....	15c	....	10c	....
Paris	....	....	....	....	....	....	....	....
Potosi	50c	40c	55c	35c	45c	40c	45c	40c
Pinal	3.90	3.20	3.40	3⅛	3	2.80	3	2.60
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	55c	30c	1.10	20c	85c	80c	95c	75c
Seg Belcher	....	....	....	....	....	....	1⅛	....
Sierra Nevada	5⅞	5⅛	6	5⅛	5⅝	5	6⅜	5
Silver Hill	10c	5c	5c	....	....	....	....	....
Silver King	16⅜	16⅛	16⅞	16⅛	15⅞	....	15⅛	15
Succor	....	....	....	....	....	....	....	....
Summit	....	....	20c	....	....	....	....	....
Scorpion	70c	50c	85c	10c	60c	35c	70c	55c
Solid Silver	....	....	....	....	....	....	....	....
Star	10c	....	....	....	....	....	25c	....
South Nevada	7⅛	7	6⅞	....	6⅞	....	7	....
Syndicate	15c	....	15c	10c	10c	....	10c	....
Tioga Con	....	....	10c	....	....	....	10c	....
Tiptop	2¼	....	2⅜	2¼	....	....	2.60	2⅜
Tuscarora	....	....	....	....	....	....	15c	....
Union Con	9⅞	9	10⅛	9⅛	9⅜	9	10⅜	9⅛
Utah	2.10	1.05	3.70	1.15	3	2.80	4⅛	3
Ward	3⅜	....	3⅜	....	....	....	3⅜	....
Wales	45c	....	45c	40c	....	....	....	....
Yellow Jacket	75c	25c	65c	45c	60c	50c	75c	65

Sales at S. F. Stock Exchange.

Thursday A. M., Jun 22.

400	Scorpion	60	
1150	Alta	75@70c	
185	Union	9⅛@9⅜	
325	Andes	40c	
170	Utah	3.90@4	
330	Bullion	90c	
180	Yellow Jacket	75c	
570	Benton	10c	
	AFTERNOON SESSION.		
130	B & Belcher	4.60@4.65	
100	Argenta	22c	
445	California	10c@15c	
50	Crown Point	40c	
800	Con Virginia	40@45c	
600	Hale & Nor	1	
100	Chollar	60c	
110	Gould & Curry	1.70	
100	Exchequer	15c	
480	Mexican	5⅛@6	
170	Gould & Curry	1.70	
100	M White	4.65	
80	Hale & Nor	95c	
100	Mono	5	
950	Justice	25c	
100	Noonday	85c	
920	Mexican	6⅛@6⅜	
420	Ophir	3.15@3⅛	
670	Ophir	3.15@3.20	
720	Savage	85c	
150	Savage	80c	
20	Union	9⅛	
280	Sierra Nevada	6⅛	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive furtber reports:

Horn Silver, Jnne 11th, $27,500; Hanauer, 11th, $23,000; Stormont, 11th, $3,450; Queen of the Hills, 11th, $1,275; Ryan, 14th, $2,048; Horn Silver, 14th, $17,500; Germania, 15th, $7,000; Hananer, 15th, $2,100; Mayflower. 15th, $11,050; Hanauer, 16th, $1,410; Mayflower, 16th, $5,350; Bullionville, 16th, $3,461; Frisco, 15th, $4,282; Tintic, 16th, $1,593; Barbee & Walker, 16th, $1,578; for Salt Lake City for week ending June 16th, $151,243; Horn Silver, 18th, $35,000; Bullionville, 18th, $10,873; Hanauer, 18th, $2,030; Bingham, 18th, $1,450; Eureka Con., 7th, 8th and 9th, $6 895.16; Contention, 12th, $11,065 96; Standard, 13th, $19,654.25; Northern Belle, 15th, $8,149.56; Bodie, 19th, $6,453; Eureka Con., 10th to 13th, $9,099.16; Contention, 17th, $39,390.

S. R. De Long, Engineer of the Tucson and Gulf of California railroad, and his anveyors, returned, having completed the location of the line from Tucson to Port Lobes, on the gulf. The distance to tide water is 200 miles. In no place is the grade over 70 ft. to the mile. The average is but 30 ft. The entire route is over plains, and passes near and through a vast region of rich mineral country.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	23	50	May 2	June 6	June 27	W H Watson	302 Montgomery st
Andea S M Co	Nevada	13	25	June 14	July 21	Aug 10	Butler Burris	309 Montgomery st
Boston Con M Co	California	3	20	May 23	June 28	July 20	F F Luty	330 Pine st
Belmont M Co	Nevada	32	10	May 20	June 24	July 17	J W Pew	310 Pine st
Benton Con M Co	Nevada	8	20	May 27	June 13	July 20	Wm H Watson	302 Montgomery st
Bullion S M Co	Nevada	24	25	May 29	July 1	July 25	A J McDonnell	327 Montgomery st
California M Co	Nevada	4	10	June 10	July 18	Aug 16	C P Gordon	309 Montgomery st
Chollar M Co	Nevada	8	25	May 9	June 12	June 30	W E Dean	309 Montgomery st
Gould & Curry S M Co	Nevada	42	50	May 23	June 29	July 20	A K Durbrow	303 Montgomery st
Hale & Norcross S M Co	Nevada	74	50	May 16	June 20	July 11	J F Lightner	309 Montgomery st
Head Center Con M Co	Arizona	3	20	May 25	July 6	July 28	J W Pew	310 Pine st
Homer M & M Co	California	2	20	June 1	July 5	July 31	F E Luty	330 Pine st
Justice S M Co	Nevada	36	20	May 22	June 27	July 18	R E Kelly	419 California st
Martin White M Co	Nevada	12	25	May 9	June 20	July 20	J J Scoville	309 Montgomery st
May Flower Grav M Co	California	16	10	May 31	July 6	July 26	J Morizio	328 Montgomery st
Mexican G & S M Co	Nevada	19	50	June 6	July 11	July 20	C L McCoy	309 Montgomery st
Mono G M Co	California	17	20	June 2	July 7	July 27	G W Sessions	309 Montgomery st
Norwich G & S M Co	California	1	20	June 5	July 10	July 31	A L Perkins	310 Pine st
North Gould & Curry	Nevada	3	25	June 7	July 10	July 31	C H Mason	331 Montgomery st
Overman M Co	Nevada	53	25	May 1	June 6	June 27	G D Edwards	414 California st
Quartz Moutain M Co	California	14	75	Mar 16	May 24	June 24	E Hestres	729 Montgomery st
Savage M Co	Nevada	51	50	May 4	June 6	June 26	E B Holmes	309 Montgomery st
San Pedro G & S M Co	Nevada	5	10	May 10	June 12	July 10	W G Holmes	Sherman's Building
Scorpion S M Co	Nevada	12	10	May 25	June 29	July 21	Geo R Spinney	310 Pine st
Sierra Nevada M Co	Nevada	73	1 00	May 17	June 21	July 10	E L Parker	309 Montgomery st
Silver Hill O M Co	California	2	25	Apr 12	June 10	July 10	J W Pew	310 Pine s
Villagrana M Co	Lower California	1	20	Apr 25	June 26	July 15	A Judson	320 Sansome a
Utah S M Co	Nevada	29	1 00	May 4	June 10	June 29	G C Pratt	309 Montgomery a

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Belle Isle M Co	Nevada	1	10	May 23	June 23	July 17	E M Hall	327 Pine st
Lord of Loru G & S M Co	Nevada	3	5	June 16	July 31	Aug 21	R N Van Brunt	318 Pine st
Pioneer Con M Co	Nevada	6	10	June 9	July 19	Aug 7	J M Buffington	309 California st
Roscoe G M Co	California	1	37	June 12	July 15	Aug 5	J L Fields	330 Pine st
South Hite G M Co	California	4	10	May 3	June 5	June 28	F A Berlin	420 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Con Reforma L & S M Co	—	P Mulligan	519 Montgomery st	Annual	July 3
Excelsior Grav M Co	California	D Chisholm	327 Pine st	Annual	June 30
Kennedy M Co	—	A Wiesel	214 California st	Annual	July 5
North Belle Isle M Co	Nevada	E M Hall	327 Pine st	Annual	June 28
Santa Anita M & M Co	California	J M Buffington	309 California st	Annual	June 26
Union Con S M Co	Nevada	J M Buffington	309 California st	Annual	July 17
Yellow Jacket G M Co	Nevada	Mercer Otey	Gold Hill	Annual	July 17

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	June 12
Contention M Co	—	D C Bates	309 Montgomery st	25	May 27
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	June 27
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	60	Apr 11
Silver King M Co	Arizona	J Nash	315 California st	25	June 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	June 12

The Mining Share Market.

No special activity has been manifested during the past week in mining stocks. The Virginia *Enterprise* thinks that the present appearance of the leading north end mines ought to justify better prices, and seems to think they are liable to be seen soon. At the Mexican the outlook is improving. The winze sunk on the 2700 level is cutting into ore of a good quality. It was started 12 ft. east of the streak of ore cnt hy the main south drift on the 2700 level, and is now hetween 25 and 30 ft. deep. The ore streak in the winze is found to he almost vertical, though on the 2700 level it had a considerable dip to the east. It seems that only the top of the deposit was found on the 2700 level. It now appears to he widening, and the chances are good for finding quite a large body of ore.

A station is heing cut out for a joint Ophir and Mexican winze on the 2900 level; also a cooling house. The station requires to he of quite a large size to make room for the engine and hoisting frame.

At the joint Gould & Curry and Best & Belcher shaft they are cutting out for a tank pit and pump foundation at the 2500 level. They will soon be prepared to commence drifting on this level.

The Savage folks are preparing to explore some very promising ground, both on the 2400 and 2200 levels.

The Chollar-Norcross-Savage shaft has reached the 2600 level, and is being sunk a further distance for a snmp. As soon as a working station has been made, a main drift will he started west. This will drain all the middle mines and enable them to resume active operations.

The Yellow Jacket folks are opening out their old npper levels and will soon begin the extraction of ore tbrough the Winters shaft. Thus far the principal work has been for the purpose of securing a proper circulation of air.

Meetings and Elections.

Alpha Con. M. Co., June 16th. Directors—John W. Coleman, J. S. Wall, J. B. Russell, Jos. Clark, C. L. Weller; William Willis, Secretary and Treasurer.

Lodie Con. M. Co., June 16th. W. P. Willard, President; W. H. Lent, Secretary; Bank of California, Treasuror. Directors—Tbomas Brown, Josepb Clark, L. Teese, Jr., W. F. Herrin, Geo. W. Sessions, L. M. Jones (New York.)

New York Mining Exchange.—S. V. White, President; John Stanton, Treasurer; A. W. Peters, Chairman; E. A. Wood, Secretary; R H. Gallagher, Assistant Secretary. The contest for membership of the Governing Committee resulted as follows: To serve one year, Frank B. Whitfield; to serve 2 years, J. T. Scott; to serve three years, H. Dunhaven, C. L. Clarkson, C. H. Badeau, C. J. Werner, T. L. Watson, R. K. Cooke, A. L. Faris, A. Lexow, S. W. Hoagland.

Fair Vila Co., Tombstone, June 19th. Directors—A. B. Hull, Wm. M. Pierson, L. M. Pearlman, David McClure, James L. Kiug.

Heavy Bulkhead.—At the Alta the 2150 level has been oleaned ont and work resumed in the main west drift. They are now preparing a foundation for a stone hulkhead, which will he erected at the point where stood the wooden one that recently gave way. The stone one will be made to withstand a pressure of 1,000 lbs. to tho square inch.

The Smelters.

Smelter sites have been located from Bellevue to within a few miles above Hailey so closely together that on the map they have the appearance of a fine tooth comb. Still no preparations for huilding have commenced. Talk is cheap, but it does not erect smelters. Here at Ketchum we have the largest smelter on Wood river, with two additional stacks en route. We have also been informed that the much talked of Horton smelter that was to occupy the whole ground between Hailey and Bellevue will he put upon Bowlder creek in a short time. This may or may not he so, hut if it was to he erected at Bellevue, why are the mines in that vicinity shipping ore to Salt Lake? Why do they not "blow in" the Hailey smelter before it blows away? The Philadelpbia company's smelter at Ketchum has ore enough to keep up a continuous run until snow flies, and perhaps the whole year round. It's capacity will he from 60 to 70 tons every 24 hours, and will he "blown in" when a sufficient amount of fluxing and coal can he procured. Many teams are busily engaged drawing ore and flux, and the coal-kilns are once more in full hlast. A smelter is talked of for Trail creek and one for Bowlder, bnt as far as we can ascertain it amounts to little more than talk. We propose to give our readers nothing but the facts as we gather them, helieving that these hurrah tiger sensational articles about 14,000 smelters, half a dozen railroad terminuses, and the only town in the whole country, in time react and are detrimental to the place from which they are oirculated. Ketchum's growth has been slow, snre, and will he permanent. We have the greatest number of good mines, and the only smelting works worth mentioning. As to the fnture of our city we willingly let it rest with the development of the mines and the enterprising men hacking us. Take us at our worst and we are happy.—*Ketchum Keystone.*

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

Eagle Con. M. Co., June 16th, capital stock, $1,000,000. Directors—Peter F. Dunne, Joseph M. Nourges, Josepb Dunne, Joseph M. Byers, George E. Woodbury.

Banghart Con. M. Co, June 17th. Location, Shasta Co. Capital stock, $1,000,000, in 100,000 shares. Trustees—John H. Carmany, President; George Spaulding, Vice-President; J. Henry Applegate, Jr., Secretary and Treasurer; Fred M. Stocking, Superintendent; and Geo. H. Goddard.

Shasta M. and M. Co., June 16th. Capital stock, $60,000. Directors—Maurace B. Blake, M. A. Parks, A. B. Brown, San Francisco; W. H. Sears, Marin; G. W. Fisber, Alameda.

M. Raphael, of Wadsworth, writes to a friend of a recent strike in his mines at Downieville, Nye county, Nev., the developments showing an ore body estimated to he worth $250,000. The property comprises six mining claims. The ores are lead, with iron gangue, carrying, also, some horn silver. They smelt with usnal facility. There is a snperahundance of wood and water convenient and accessible. This camp has a large territory to draw upon, abonnding in mines in which dry ores prevail, accompanied with quartz, which is of great advantage in reduction.

Mining Summary.

The following is mostly condensed from journals publisbed in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Bright.—Amador *Dispatch*, June 17: Work is steadily progressing on the Bright mine, located in Schober's ranch, near town. The sbaft is down about 60 ft, and we are told that the prospects are remarkably favorable.

Rich Rock.—Some very rich rock, and quite a bandsome ledge of it, now exhibits itself in the bottom of the shaft being sunk on the Ginocchio mine. The rock appears mucb richer than that nearer the surface.

Decided.—The contest for some mining claims on Murpby's Ridge, near Jackson, wbich has been pending for some time in Washington, between I. N. DeWitt and Jas. Morgan, has just been decided in favor of the former.

CALAVERAS.

Gravel Mines.—Calavoras *Chronicle*, June 17: A visit to a few of the gravel mines in this vicinity during the week found tbem all in operation. Work on the Sullivan claim, at the bead of Chili gulcb, still goes on, with the object of getting the claim in a condition to work to advantage. Ventilation is needed in the diggings and bas necessitated the sinking of a shaft to secure this end. The sbaft is being sunk at the rate of about 3 ft a day, and the depth to be attained in order to connect with the tunnel will he about 135 ft. A body of good gravel has been reacbed in the tunnel, and as soon as the mine can be ventilated it will be in a paying condition. The Belle Franco, formerly the "Bob Paul claim," adjoining the Sullivan claim below, is being operated steadily. At present the company are working in old ground, requiring a great deal of timbering. The new tunnel through wbich the mine is at present being worked penetrates into the bill a distance of over 700 ft, and is in paying gravel. Labors in the Gleeson mine continue without interruption. The incline tunnel, together with the main drift, measures between 1,400 and 1,500 ft. No great amount of water is encountered, and the pump is sufficient to keep the mine clear. In the Duryea hydraulic quite an area of surface ground has been piped off during the winter and spring, and owing to the depth of the bedrock the bottom gravel could not be worked off by hydraul cing. In consequence the piping process has been suspended and the bottom is now being taken up and transported to a "dump" by means of cars. The "bottom" is about 12 ft in depth, but being of a comparatively loose nature, is easily worked, and rapid headway is being made. About 10 men are employed altogether, who take out about 150 carloads a day. On tunnel ridge opposite the Duryea claim, is the Green Mountain claim, owned and worked by Messrs. Brown & McSorley. During the past 4 or 5 months a new tunnel has been opened to the works. The old tunnel bad become in need of repairs, and as work bad reacbed that point at wbich the old tunnel did not afford the best facilities for carrying on operations, a new one was opened, by which the mine can be worked to better advantage. This mine has been paying well for years, and having been explored sufficiently to ascertain the fact that a very large body of paying gravel exists, the owners continue operations with the assurance of having a mining property that will continue remunerative for years.

Rocon Diamond.—About half a mile below the abovementioned mine, on the same ridge, is the Rough Diamond, better known as the Jillson claim. A half interest in the mine was recently purchased by H. Longly, Esq., a gentleman who formerly and for a number of years was engaged in the quartz milling business at Glencoe. The Rough Diamond furnishes an example of the indomitable pluck and perseveraunce, added to knowledge gained from experience, that is necessary to make mining enterprises successful. It was repeatedly given up by different parties as ground that would not pay to work, the character of a great deal of the ground being of the nature of cement, and required to be put through a mill. Besides this it was also found, but not until recently, that the bottom gravel was not always the pay gravel, but that the pay is sometimes found in ground six or eight feet, and even more, above the ledge, with comparatively nothing in the gravel upon the ledge. The main tunnel has now reached a distance of 800 feet into the hill, and is to be carried farther. From this a north and south drift are run, the former being about 175 ft in length, and the latter over 350 ft. The main tunnel has recently been re-timbered and made secure. Seventeen men are employed, and the force is to be increased at once. Work goes on night and day, the underground management being under the direction of George Green, Esq., a thoroughly practical and experienced miner. The mill with five stamps is kept running continually. Five stamps more are soon to be added to the mill, the framework having originally been made to admit of it, if desired. The mill is advantageously situated to permit of working the mine from four different tunnels, which were run in former years, and can be used to facilitate operations in the future. Messrs. Jillson and Longly have a claim that is calculated to last for many years and be a paying property.

Hard Times Down.—According to report, the Gwin mine has closed down permanently, and the machinery is to be disposed of. A few weeks ago some rich rock had been struck in the 400 level, but it did not hold out, proving to be only a "bunch." The Norwich mine, at Gleucoe, and also the Fidelity, have shut down during the week. Whether the suspension of operations will be permanent, or only temporary, is not yet known, but it will probably be but temporary.

EL DORADO.

Gold Hill.—*Mountain Democrat*, Juno 17: Alf Rogers struck a pocket a short time ago in his mine on Putty ravine, about one mile south of Gold Hill, from which he took out about $2,500 in two hours.

The Benfeldt Mine.—Fred Benfeldt made another good clean-up at his gravel mine near Smith's flat last week, amounting to 225 ounces, worth $18.50 per ounce—$4,162 50. His expenses amounted to a trifle under $2,000. Profit, $2,162.50 for 12 days run, or a little over $180 per day.

INYO.

At Work.—Inyo *Independent*, June 17: Dick Glenn and George Floyd are working a rich gold ledge, situated about a mile from the New Coso station, in the range of mountains generally referred to as "Old Coso."

Inyo Con. M. & M. Co.—The special clean-up of the big mill at Panamint was to have been completed on the 15th. With the bullion already shipped, on hand and yet to be melted, the proceeds of the last run will aggregate 40 bars, from 900 to 1,000 ounces each, of a total value of from $38,000 to $40,000.

To Start Up.—The Hawley mill, at Owens Lake, will start up on Monday next for a protracted run, about 600 tons of ore being now on hand. The mill has been standing idle for a couple of weeks owing to the burning of the boat *Bessie Brady*, and the consequent cutting off of the wood supply.

Kearsarge District.—The shaft in Kearsarge tunnel has been sunk 30 ft, and the vein of ore struck a short time ago has steadily increased in width as depth has been attained. The outlook is very encouraging now for a bonanza in the Kearsarge mine.

Monock.—After a few days stoppage on account of the breaking of water pipes, the Modock furnace fired up again and is running steadily, making a fine output of bullion.

MARIPOSA.

Coulterville.—Mariposa *Herald*, June 16: Messrs. Dan and Charles Wagner, of Coulterville, were in town a couple of days the first of the week, and called on us last Monday. They speak very encouragingly of the prospects of that section of our county on the other side of the river. The new mine of Brown, near Garrote, has been bonded for quite a nice little sum, besides what has been paid in

cash. Rush of business on the part of our visitors prevented us from obtaining full particulars. Eight wagons, loaded with machinery, were seen en route for the mines in that section, last week. This bespeaks a lively future for our sister town. We hope that Coulterville will realize all that the prospect indicates. The Cook company is continuing its work on the Potsi, and in a short time an immense body of good milling rock will yield the reward of industry and enterprise. The Marble Spring, or Compromise, shows a prospect that encourages its owners to continue their work with renewed zeal. Rumors afloat a few weeks ago are to the effect that the company has been shipping at least $1,000 of amalgam per week. A few more such mines scattered through the county would soon give us a return of the livelier times that are faded and gone. All that is needed to stir up the county and place prosperity once more at our door is to get a few enterprising miners at work. Certain retarding influences have prevented this section from being fully prospected. Other parts of the State, where thorough work has been done in mines, have well paid for the trouble. Let competent men give these parts a thorough prospecting, and we are sure that they will be satisfied with the results. There is no reason why these parts should not yield their due proportion of the precious metal. Capital and a fair trial is all that is required.

THE MAGGIE JOHNSON MINE.—Mariposa *Gazette*, June 17: This mine, which is situated on the Kendall mountain, at the head of Cathey's valley, is fast acquiring prominence, and, judging from the result, it will be listed hereafter as one of the leading mines of the county. For some time past the mine has been worked by its owner, Mr. D. M. Johnson, Jr., with arastas, which was paying him from $20 to $30 per ton, when he was first observed, about 6 months since, by Mr. T. L. Kemble, of San Francisco, a mining engineer, who immediately became attracted to the spot, and bonded the mine from Mr. Johnson for 6 months for $2 500. Mr. Kemble proceeded as soon as practicable to erect a 5-stamp mill thereon, run by a 10-horse power engine, which will crush 4 tons every 24 hours. The mill had been running until last week, when a clean-up was made, showing the average of 16 tons to be $23 per ton. This fortunate result will undoubtedly lead to permanent mining in this section, for there are several other mines in the same neighborhood, known as the Kendall, Christman Olft, and others, that have been sufficiently prospected to be known as paying mines if properly developed.

MONO.

PATTERSON DISTRICT.—*Chronicle-Union*, June 10: On Tuesday we visited the new town of Clinton, in the Patterson district, which is destined to be one of the most promising mining centers on the Pacific coast. The new town site is located at the base of Clinton peak, and about two miles from the Aurora and Carson road. It is in Mono county, the State boundary line running about one mile north. In an air line it is about 10 miles north of Bridgeport, and 22 miles northwest from Bodie. It boasts of a five-stamp mill—Summers' mill, one store and postoffice, two saloons, the Summers and Ebi boarding house, a large and well appointed livery stable, two assay offices, a tonsorial establishment and bootmaker. Between 30 and 40 buildings now constitute the town, but new ones are being started every day. Wood is delivered by Indians at $2.50 per cord. The Summers mill has just been supplied with a new engine and boiler from the Gold Hill foundry. The engine is of 50-horse power, which will enable the owners to make a 10-stamp mill of it with comparatively small outlay. Another pan will soon be put in, making three in all, which will add materially to the capacity of this little bullion-producer. The mill commenced work again on Wednesday evening on ore from the Summers mine. The ore is packed on mules from the mine, a distance of three miles, but the company will, in due time, build a wagon road to it. The old mill turned out about $8,000 a month, with but one shift and from medium ore—float ore, we may say—and as the capacity of the works has been increased and the mine is producing better ore, we may reasonably look for a greatly increased output of bullion from the Patterson district. Work on the Summers mine is being pushed with good results. Henry E. Battin has been appointed superintendent and has taken charge. The 200-ft level has been reached, the developments being highly satisfactory, the ore increasing in quantity and richness as depth is attained, and placing the mine in a condition of permanency as a bullion-producer. Substantial prospecting is the order of the day in the Patterson district. The Summers are prospecting several other claims, which they consider better than the Kentuck, better known as the Summers—ore from the Patterson assaying as high as $3,000 in silver and gold to the ton.

THE MAY LUNDY.—Homer *Index*, June 17: An additional force of 20 men went to work in the May Lundy mine Thursday evening, and others will be added from time to time as required. The tramway from the mine down to the wagon road in Lake canyon has been put in thorough repair, the toll-road has been widened and otherwise repaired, and ore is being steadily sent to the mill by 6-horse teams.

GREAT SIERRA-TIOGA.—The tunnel was driven 20 ft during the week. The header is still in very hard black slate, highly mineralized, hard on drills, but breaking well. Two hundred and forty feet of track has been laid in the tunnel, so that hereafter the work of clearing away the broken rock can be prosecuted much more rapidly.

PLUMAS.

PLUMAS NATIONAL MINE.—Greenville *Bulletin*, June 14: The district is now in a very prosperous condition. All the mills but two are running, the exceptions being the Monitor and the Plumas National. The last-named mine passed under the control of a new company in New York some time ago. The property has a complete plant of the most improved machinery, including engines, mill and Frue ore concentrators. The facilities for working are all that could be desired. Wood and water are abundant; and with reasonable prudence in the management the mine can be made a good paying property.

GREEN MOUNTAIN MINE.—The Green Mountain mills are running steadily on good ores. The work on the tunnel is progressing well. Every day's work done on this property serves to demonstrate more fully its extent and value. Its present condition is the best proof of the sound judgment of the men who invested money enough to develop it and bring it to the condition it now is in. The Italians who are working over the tailings have just started a new arastra.

GOLD STRIPE MINE.—On last Friday morning the Gold Stripe mill at Wolf Creek was started up, and is now running steadily. Yesterday morning Mr. Pardee received from New York his appointment as superintendent, and will henceforth have charge of both Gold Stripe and Cherokee mines.

INDIAN VALLEY MINE.—The Indian Valley mine is doing about as usual. No new developments have lately been made; the monthly yield of bullion differs but little one month from another. There is ore enough in sight to make extensive prospecting unnecessary.

CHEROKEE MINE.—The Cherokee mine is doing very well. Recent indications in the mine warrant the belief that in a very short time some valuable developments will be made.

SAN BERNARDINO.

CALICO CONSOLIDATED.—San Bernardino *Index*: John Lawshe, A. H. Hart and W. J. Linville have purchased an interest in the Calico Consolidated mining company, in which Barton, V. Mitchell and others are already interested. Mitchell and Linville have just returned from the mine, and are highly pleased with its prospects. J. C. Dickson has let a contract to sink 40 ft more on the shaft of the Wonder mine, at Calico. The shaft is already down 50 ft. Eighteen heavily laden teams for Calico were counted on the road on Sunday. Owens & Morse are making adobes at the Fish Ponds station, for use at Calico. Mud houses at Calico will make cool and pleasant resorts. Two of Nadeau's large freight teams, consisting of four wagons each, passed the Fish Ponds station on Saturday, having on board 28 tons of freight for Providence mountain. Ten tons of the richest ore from the Silver King mine, Calico, were shipped to San Francisco last week for reduction. J. D. Bethune bought a one-fifth interest in the Bedford Forest mine, at Calico, yesterday, of M. A. Murphy, of Colton, for $1,025. The developments on this mine give the expectation that it will pay for the working right along.

SIERRA.

GRAVEL MINE SOLD. *Mountain Messenger*, June 17: Eastern parties have purchased a controlling interest in the Lafayette hill gravel claim on the ridge, between Alleghany and Moore's flat, and a short distance below Clip's flat. The ground has been well prospected, and the new owners are now in San Francisco for the purpose of getting machinery with which to work it. They propose to drift the ground and lower the gravel to Kanaka creek by machinery for washing.

ROBBED.—Some persons robbed the sluices of James Patterson, of Excelsior, last week. The robbers were tracked as far as Red Dog, but could be followed no further. James is positive that it was not done by Chinese. No great amount was obtained.

COARSE GOLD.—The encouraging news comes from American hill that a good prospect of coarse gold has been found. The bedrock is pitching into the mountain.

BLACK JACK.—Mr. Burke, of Alleghany, is in charge of the Black Jack mine for the owners.

NEVADA.

WASHOE DISTRICT.

CONSOLIDATED VIRGINIA.—*Enterprise*, June 18: The joint California east drift on the 2700 level has been advanced 19 feet. The joint west drift on the same level has been advanced 26 ft.

OPHIR.—The main south lateral drift on the 2900 level has been extended 21 ft. Are cutting out a station for the joint Mexican winze. Ore is being extracted from the croppings.

SIERRA NEVADA.—No. 2 winze on the 2500 level has been sunk 8 ft. On the 2700 level main north drift No. 1 has been advanced 20 ft. Are still repairing the winze between the 2300 and 2400 stations.

UTAH.—Repairing and re-timbering the top of the incline. The repairs on the guides in the incline have been completed. The south lateral drift on the 2500 level has been advanced 9 ft, and the east drift on the same level 5 ft.

CALIFORNIA.—The south drill hole in the main south drift on the 2700 level has been extended 150 ft. On the same level the joint Consolidated Virginia east drift has been extended 26 ft. Are extracting ore from the old croppings.

MEXICAN.—Crosscut No. 2, on the 2700 level, has been extended 20 feet. Are enlarging No. 1 winze. This winze is showing some fair milling ore in the bottom. West crosscut No. 1, on the 2900 level, has been extended 33 ft. Are cutting out a station for a joint Ophir winze.

UNION CONSOLIDATED.—Are stoping out ore on the 2500 and 2600 levels. During the week 625 tons have been extracted, and 633 tons and 1,910 pounds sent to the mill. The west cross-cut, on the 2600 level, has been extended 10 ft. On the 2700 level, south drift No. 2 has been advanced 30 ft, and the south drift on the 2900 level has been advanced 20 feet. The amount of bullion in the office is $12,547.03.

YELLOW JACKET.—The rise of water in the mine during the past week has been 12 inches. At the Winter's shaft the sagebrush station is completed for 200 ft, having repaired 52 ft during the past week. The ground passed through being clay, is very unfavorable to rapid progress.

SUTRO TUNNEL.—Main tunnel repairs, 11,000. 19,000 and 19,200. The track and intersection of main tunnel and north lateral has been re-laid and repaired, and some repairs made at point 11,000. The flow of water is equal to 6,650,139 gallons per 24 hours.

COLUMBUS DISTRICT.

NORTHERN BELLE.—Candelaria *True Fissure*, June 17: During the week all preparations needed have been fully completed to enable the railroad company to do the ore hauling. The first load was delivered at the mill on Saturday last. Work during the past week on the fifth shaft level has not progressed as rapidly as usual, the formation being considerably harder. The main drift has been extended only 17 ft, the face being distant from the station 200 ft. The other shaft levels are looking full as well as last week and continue their usual yield. The levels above the adit show very well throughout.

ESMERALDA DISTRICT.

CORTEZ.—Esmeralda *Herald*, June 17: Last Thursday, W. P. McIntosh received word from the New York company to start work on the Cortez mine, and he set about immediately to get everything in readiness. Yesterday morning operations began at the mine once more in earnest, with a good force of men. There is a large amount of rich ore developed in this mine, which the superintendent informs us he will commence stoping at once, and will ship to mill just as soon as the best arrangements for the reduction of it can be perfected. As work was only begun yesterday, and the superintendent too busy to be very communicative, the foregoing facts are all we are able to lay before our readers this week in regard to what is to be done.

LEWIS CONSOLIDATED.—The Lewis Consolidated mine, on Middle hill, commenced work one week ago, by starting to drift north and south in the ledge from the main shaft. Thursday the face of the south drift was in ore worth several hundred dollars per ton, according to the judgment of some of the best judges of ore in the camp. Yesterday, while working in the north drift, the miners discovered that what they supposed was the hanging wall had commenced to fall down. This was thought to be rather strange, and the miners were directed to run in a little farther, to see what was there. After breaking down about a foot thick, a vein of very rich ore was found. The vein is not very large, though large enough to pay well if it continues down as rich as where found—but who can tell how soon one of those rich chambers may be struck? Verily, one man can see no farther into the ground than another. The find being about the center of the district, speaks volumes for it. Although very large and rich bodies of ore were found on the hills each side of Middle hill, it seems to have been almost completely neglected, and not prospected to any great extent. With the starting up again of the Cortez, which all who have examined claim to be rich in gold and silver, and the present flattering prospects of the Lewis Consolidated, the mining outlook of the district has brightened materially the past few days, and we honestly believe we have a future before us second to no mining camp in Nevada. Mr. McIntosh, who has taken charge of the Cortez, has for the past four years made a careful study of the mines of the district, and we think is as well fitted to work them successfully as any person we know of.

EUREKA DISTRICT.

THE FIRST ORE SHIPMENT.—Eureka *Sentinel*, June 16: The first ore shipped from the Albion mine since it has been shut down by litigation with the Richmond company passed through Main street yesterday afternoon to the reduction works of the Eureka Consolidated. The shipment was about 15 tons, in 2 wagons drawn by Charley Broy's ten-horse team. In the first wagon was a hogshead-shaped canvas affair, braced inside by stout hoops, bearing the ironical superscription in big black letters, "This is T. W.'s Hat," and on the east side, "Not a hat full of ore in the mine"—expressions borrowed from the argument of the Richmond counsel—while on the rear of the canvas was painted a hilarious rooster crowing and sportively exhibiting his spurs. The wagons, which had been expected at 2, did not appear until nearly 5 o'clock, by which time the street was thronged with people to view the spectacle. While the wagons were being loaded at the mine, the New Town people turned out in force, and enjoyed the sight hugely. The E. & P. locomotive backed up as near as possible—within a stone's-throw of the dump—and whistled in congratulation.

LEWIS DISTRICT.

BETTY O'NEAL.—Lewis *Herald*, June 14: In compliance with instructions from the company's office in San Francisco, the force at the Betty O'Neal mine has been reduced to about 30 men. The company give as a reason for the reduction the expense attached to having their ore worked in a custom mill. It is the intention of the management to open up the mine thoroughly, and take out as little ore as possible at present. The shaft will be sunk, levels run, and the ore bodies exposed; and if the prospects will justify, a mill will be built. The winze being sunk is in good ore all the way, and opening up a bonanza. The ore that is being taken out of different levels is of good quality, and the ore bodies are not decreasing in size. On comparing the average of the ore worked from the Betty O'Neal under the management of Mr. R. Gilles and the last run, a difference of but 7 cents per ton was obtained in favor of the last run. The first run was over 300 tons, and the last over 500 tons. Average of ore, $113.84 per ton.

EAGLE MINE.—The tributers are still taking out ore from the Eagle mine, and making good wages. About 25 tons of their ore has been worked at the Eagle mill, but we have not been able to obtain the result. Why there should be any mystery about it is something that we do not understand. The tributers even do not know what their ore worked, and are awaiting returns from assays sent off. And right here we return our sincere thanks to the superintendent of the Betty O'Neal mine, who has on all occasions given us all the information required as to amount of ore worked and value of bullion shipped. John Rhoads and H. Kerr are opening up a prospect south of the new mill. They have not had any assays from there yet, but say they have a large ledge of decomposed quartz. In Campbell district the Hoskin boys have about a carload of ore out, ready for shipment to Salt Lake reduction works. Twist brothers have also some good ore on their dump, and are taking out more. The Frisbie mill has been placed in running order, and it is expected will start up on ore from the Lady of the Lake mine shortly. Several prospectors have brought pieces of good ore in from new discoveries for assay, mostly galena.

SACRAMENTO DISTRICT.

A GOOD MINE.—*Silver State*, June 15: Walter Schmidt, late superintendent of the Desert Crystal Salt Works, at White Plains, and a man named Bender, have discovered a vein of ore in Sacramento district which is proving very valuable. They had five tons of the surface rock worked at the Vandewater mill which yielded $100 to the ton. They now have about two tons of selected ore from the mine which it is thought will work over $2,000 to the ton. Much of the ore is horn silver, like that found in the Moonlight mine when it was worked years ago.

SILVER GLANCE DISTRICT.

PRINCIPAL MINES.—Lyon County *Times*, June 12: Silver Glance District is 34 miles south of Carson City, on the Carson and Aurora wagon road, near the Mountain House. The principal mines in the District are La Adventura, Union, Little Giant, Orphans and Minnehaha. Mr. Dwelly is building a five-stamp mill to work La Adventura ore, which will start up in a few days. The ore will pay from $20 to $50 per ton. Mr. Williams is running a two-stamp mill on ore from the Orphans mine, which is very rich. There are several claims in the district that are worthy of notice, but they are now lying dormant on account of the owners not having the means to prospect them. The ores of this district are principally gold, the gold being worth over $18 per ounce. The veins of the district run northeast and southwest, and dip to the west. The formation is porphyry.

ARIZONA.

TOMBSTONE.—*Epitaph*, June 15: There is no particularly noticeable change in the mines of Tombstone camp since our last report. All are looking well, and steady improvement in their size and richness, is the word all along the line. A very important strike has been make in the Randolph. In the crosscut connecting No. 2 with the drift from shaft No. 1 a rich body of ore has been encountered, which gives promise of being one of the richest yet made in this district. The crosscut has already penetrated this ore body 7 ft, and the face shows a fine body of carbonates and chlorides. The owners of this valuable property are feeling good, as well they may, over their prospects. This strike cannot but have an important bearing on that group of mines in the southwestern portion of the district. Those mines are rapidly coming into popular favor, and their strength and permanency is being demonstrated day by day, as depth is attained. Looking the mineral field of Tombstone carefully over, it can be asserted that its present condition never appeared healthier, or its future prospects brighter. It remains the leading bullion-producing camp on the coast, and as the wonderful richness and extent of its ore bodies is being thoroughly understood, confidence in its brilliant future gains additional strength.

SUMNER.—Prescott *Courier*, June 16: The tunnel in the Sumner mine is now in about 75 ft. Pieces of the ore recently thrown up by the upcut were rich in gold.

PARKER MINE.—The Groom creek mill is running on refuse stuff from the Parker mine, which is yielding at the rate of $20 a ton, gold.

HASSAYAMPA.—Supervisor J. N. Rodenburg and Mr. George Sines came in last evening from visiting the Dosoris and Blue Dick mines, Hassayampa district. They last evening expressed themselves delighted with what they had seen. George says there is a 4-ft vein of rich ore in the Blue Dick. Tunneling to strike the Dosoris at considerable depth is progressing.

SMELTING.—Mr. J. T. Shull, just from Lynx creek, gives a glowing account of Prof. Shafer's good luck in smelting Dosoris and other ores. The furnace "froze up" night before last. Major Burke, Prof. Shafer and the workmen staid with it all night and got her back again. When Mr. Shull left, 20 bars of silver had been run out. Messrs. Reede and Boyd, practical Nevada furnace men, have joined Prof. Shafer's force. Good ore is abundant and success is almost certain.

TIGAR.—George A. Hammond, just from the Tiger mine, reports progress in freeing the mine from water.

COLORADO.

CARIBOO.—Cor. Denver *Mining Review*, June 16: The shaft is down 1,000 ft, with levels at intervals of 60 ft from the surface, and crosscuts east and west for a distance of 900 ft. In July the 800 and 920 levels will be connected by a winze, increasing the output to 15 tons daily, and one month later the 920 and 680 levels will be connected in like manner, which will handsomely increase the quantity of mineral raised. The pay streak runs from 3 inches to 4 ft, the average mill run amounting to 52 ounces. During the past year the yield amounted to the handsome sum of $232,000, and this year the amount will be increased. The building and machinery erected is the finest we have seen in the county. The shaft, hoister, compressor and sorting room are all covered by one roof. The building is 80x30, the engine is 80-horse power, and compressor six-drill capacity.

IDAHO.

BULLION CAMP.—Wood River *Miner*, June 10: About 150 miners are now employed in mines in this camp. The Jay Gould is proving to be a bonanza for its owners. The Porter Brothers have struck it rich in the Eureka fraction, lying west of the Eureka mine. All the mines of Bullion are improving as depth is attained. The Mayflower mine will send a block of solid galena weighing 1,000 pounds to the Denver exhibition.

THE ROAD.—The road from Galena to Vienna is being put in good order, so that the machinery for the Johnston Brothers mill can be taken in as soon as it arrives at Galena.

NOTES.—W. O. Arnold made a rich find near the head of Warm Spring creek one day last week. Within a few hours from the time he found the croppings he had a pile of glittering galena out on a newly-made dump. Mr. Arnold has associated with him Mr. Lee Baker, of Dakota, and the two propose to push work on the find as rapidly as possible. At present writing they have some three tons of ore out, and a body of solid galena in place measuring over 2 ft in width. The Columbia and Beaver will will be started up just as soon as Mr. J. K. Owen, who is now in Sawtooth, can get things in readiness. Mr. Owen is to put up the mill for the Vienna Con. M. Co., of which the Johnston Brothers are principal owners. All of the mines in and near Vienna are said to be showing up finely. The Solace, Mountain King and one or two others, bid fair to outstrip, in richness and productiveness, any mines yet developed on or near Wood River. A considerable body of milling ore has been discovered on Trail creek. S. S. Houston is the fortunate finder. The ledge matter is from 4 ft to 6 ft in width, and said to be very rich. In the immediate vicinity of Mr. Houston's claim are a number of good prospects, but they are all argentiferous galena in character. Some of these specimens of silver-bearing lead ores have returned assays as high as 700 and 800 ounces silver to the ton. The new find is on the same belt as the Elkhorn and many other valuable mines, and the chances are the ledge will turn into smelting ore before its owner has sunk many feet on it. A number of new finds have been made in the hills east of Hailey during the week. Some of them are very promising in appearance. The Philadelphia Co.'s representative are actively engaged in operations on Warm Spring creek and at Muldoon, on Little Wood river. In the former place the smelter, which was put up last fall, is nearly ready to be blown in, and a second stock of 40 tons capacity is being added. The new smelter was unloaded on the site chosen for it last Saturday afternoon. A matting furnace is under course of construction and new hoarding apartments are nearly finished. Fifteen more coal kilns are being built, and other improvements of note are going on. There will be lively times on Warm Spring creek this summer. Hundreds of men have been put upon different properties during the past few weeks, and when the first pay-day comes its influence will be felt in Hailey. At Muldoon, on Little Wood River, the activity which has prevailed in both mining and town building is on the increase. Lots are still in good demand at fair figures, and work is being done in and about the mines. New strikes and finds are of daily occurrence, but though bulk predominates wherever ore is found, the majority of prospects are of low grade. The camp, however, is about as promising as any in this section. A 2-ft vein of solid galena ore has been uncovered near the North Star mine. The fortunate finders are Ed. Ryan and Tim Keegan. The Germania mine will send its ore to the Oaklena works for reduction. A 2-ft vein of high-grade ore has been struck in the Golden Sheaf mine, which returned assays varying from $138 to $312 in silver. The Tennessee shows a 4-ft vein of an average value of 150 ounces silver to the ton.

WOOD RIVER SITUATION.—*Times*, June 14: The past week has been exceedingly quiet on lower Wood river, and nothing very startling occurred. A rich strike of ore was made in the Deadshot, one of the claims of the Bellevue mining company. Three other strikes were made on Deer creek, and a number of others were probably made elsewhere, but the frequency of such occurrences here has rendered them commonplace. The mines of Bullion continue to ship ore in a moderate way, their owners not being in any hurry, apparently, to convert their galena into cash. The Mayflower is, however, doing nobly, its aggregate shipments to date this season exceeding 250 tons. E. Daft's ore-buying establishment was opened in Hailey on Monday. Mr. Daft is prepared to sample, and pay for immediately after sampling, all ores that may be offered to him, and in any quantity, from 100 pounds to any number of tons. He intends to compete with Salt Lake, San Francisco, Omaha, Kansas City, and all other markets. At Ketchum, the Philadelphia company's smelter was blown in last Saturday, with several hundred tons of ore in the bins, and sufficient flux and charcoal on hand for a lengthy and successful run. There has been quite an exodus to the upper country, caused by the opening of the grade across the Sawtooth range, and the towns of Vienna and Sawtooth are booming.

MONTANA.

GLOSTER MILLS.—Helena *Independent*, June 17: The product of gold from the last two clean-ups of the Boston & Montana's Gloster mills amounted to $27,115 for 26 days of running, and from present indications, this amount will be increased considerably in the future for rune of the same number of days. Thus far, every step in the progress of development has only enhanced the value of the mine, by adding to the immense ore reserves that guarantee the future of this enterprise. A large steam-hoist will be erected over the main shaft of the Gloster as soon as practicable. The Gregory works are turning out lead bullion at the rate of six tons per day, which averages, in gold, silver and lead, over $300 to the ton. Out of nearly 300 tons of this furnace product the lowest assay was 135 ounces of silver and 3.02 ounces gold, and the highest was 152 ounces silver and 5.27 ounces gold per ton. During the month of June the shipments from the Gregory amounted to nearly or quite $100,000 in value. There is a rumor afloat to the effect that the Bonanza Chief mill will be likely to find a location and active service soon in the Ten Mile district.

OREGON.

NOTES.—Jacksonville *Times*, June 16: Mining is approaching a close.....Considerable prospecting in quartz is now being done in Willow Springs precinct..... A. Schmidt has built a new reservoir to facilitate his mining operations on Jackson creek.....The English Co.'s mines at Galice are said to have paid better than usual last season.....Roten Bros., of Willow Springs, have their arastra in operation and are crushing some rich quartz .....Hayes & Magruder will soon commence getting their mines on Rogue river ready for Winter.....The miner's of Gall's creek are doing pretty well this season. Some of them have considerable water yet.....Water is getting light, and nearly all of the miners will be done for the season before the end of the month.....R. Cain, who came up from Galice creek last week, says that Green Bros. are now engaged in crushing rock worth $100 a ton.....Lannes Klippel and W. S. Brodbeck were down from Big Applegate last week and report mining operations in full blast there.....Simmons & Howard, of Galice creek made several partial clean-ups, which resulted satisfactorily. The final one proved the best of all.....Rummell & Bagley are about ready to commence mining the bed of Bear creek. They have just finished a large water wheel with which to facilitate operations. .....Dan Silva, superintendent of the Applegate & Ayer Co.'s mines, was in town last week and reports that he struck the old channel again. Better pay than ever is expected hereafter.....Patterson Bros. are putting in a little giant at their claim on Beaver creek. Their ditch will be 300 rods long, and they have 700 ft of pipe on the way from San Francisco. They will use a 3-inch nozzle .....Lance & Co. and Goldworthy & Co., of Foot creek, are still busily engaged, and will make excellent runs. These claims are rigged up in good shape, and are well supplied with water for the greater portion of the year. .....Sheriff Bybee and A. W. Hawkins left for Waldo, Monday, to look after their mining interests. They are interested in one of the best placer mines in the State with Wm. Newman, and propose putting it in good shape for next winters' run.....Winer & Simmons, of Waldo, are still piping day and night, but will commence cleaning up in about a month in order to get ready for winter. They have a full head of water for several months longer, as there is still considerable snow in the mountains.

UTAH.

VALE LEDIS.—*Silver Reef Miner*, June 16: Suits in attachment aggregating some $8,000, have been commenced against the Leeds company, and their property here has been levied upon, and is now in the hands of the Sheriff. This wholly unexpected move on the part of the creditors seems fully justified by the dilatory action of the trustees, and their failure to provide means to meet matured out tanding obligations. At the time of the commencement of legal proceedings the company's mill was running profitably upon tailings, of which there is estimated a two years' run. There is no question but that it would have been but a matter of time when the company's indebtedness could be fully met from this source, but creditors generally are not disposed to wait an unreasonable time for their money when there are sure means of collection at hand. The closing down of this property is the more to be regretted on account of the recent encouraging outlook, it having been under a cloud for the past two years, and just being again put in good running condition through the energetic effort of the superintendent.

A Comstock Hero.

How Van Dusen Carried Supplies into the Alta.

The reporter had an interview later with Mr. Van Dusen. He is a rather slim man, about five ft. seven inches tall, with a thin, dark beard, black eyes, prominent nose and lantern jaws. Indeed, he could stand very well for a reduced photograph of Brother Jonathan. But Van Dusen is not a Yankee. He is a native of Michigan, and 47 years of age. The reporter found the hero of the day in the wash-room of Fitzpatrick's boarding house in lower Gold Hill, rubbing soap on his hands, and wholly absorbed in the occupation. He looked up with some surprise from his basin in the wooden sink when the reporter spoke to him, and said he wanted an interview with him. Van Dusen is not a talkative man, and it was only in response to the journalist's constant questions that the story of his adventures was drawn from him piecemeal. While giving a bit of information as to his perilous journey, Van Dusen would pause between splashes in his basin, turn up his dripping countenance for a moment, and then industriously resume his ablutions. He was rather amused than otherwise that a newspaper should think it worth while to send a reporter to ask him about such a trifle as going into a drift 1,400 ft. long, 2,150 ft. below the surface, filled, in part, with almost scalding water over three ft. deep deep and loaded with poisonous gases that had slain two men who had made the attempt before him. There was no affectation about his unconsciousness of having done anything heroic. It was absolutely real.

"Oh, no; I'm not exhausted," said Van Dusen, as he rubbed his face vigorously with the towel on the roller. "I'm feeling chipper —never better in my life."

He encountered the bodies of Bennett and Callahan. Both were lying on their backs. He merely paused as he came to each corpse, and then passed on.

"Then," said Van Dusen, "I got to the cooling house and saw the boys."

He seemed to think that the statement of this fact furnished all the information that was necessary.

"They were glad to see you, of course?" suggested the reporter.

"Yes, but they were a darned sight gladder to see the ice in my machine."

He had to leave his lantern out in the drift, as there was a tremendous draft in the cooling house.

"It was pretty dark in the cooling house," said Van Dusen, "and when I went in the first thing I asked was, how many of them were alive. They said the whole seven, and I said I was mighty glad to hear it. 'What do you fellows want most?' I said, and they answered 'grub and ice.' They did go for my ice. (Mr. Van Dusen chuckled at the recollection.) One chap—it was so dark I couldn't see him—laid his arm across his breast and began hauling it out of the machine, and piling it up on his arm. I guess they knew what had happened to the two boys that went down in the morning, for they asked me if there were any dead bodies in the drift. I said there wasn't, for it wouldn't have done 'em any good to know. They had seen the lights that the boys carried, and they went out kind of sudden when they fell, of course. so it wasn't hard to guess what happened."

"They had fixed things in the cooling house, and were pretty comfortable, managing to get tolerably cool air and water. They wanted all the air they could get, of course, and one of 'em sings out to me as I was going, to tell 'em on top to work hell out of the compressor. I thought, perhaps, that there might be one or so in the crowd that was near giving in, and I asked if anyone wanted my knapsack to try to make the riffle for the shaft, but they wouldn't hear of it, so I started back. Bennett walked down the drift a ways with me. He had his head on him, and wasn't scared or anxious a bit, so far as I could see."

On the return trip, one of the rubber air-tubes of his knapsack got loose, and he had to depend upon one. Then the foul air put his lantern out, and his only guide as he floundered through the last 300 ft. of hot water, was the faint gleam of the candles of the men at the station. One of the doctors at the mine said that there was not one man in a thousand could have achieved the feat accomplished by Van Dusen, and that it was marvelous that he should apparently suffer so little, physically and mentally, from so terrible an ordeal. Van Dusen, at six o'clock, was back in the hoisting works, standing around with his hands in his pockets, taking a keen but calm interest in all the work that was being done toward the rescue of his fellow miners.—*Enterprise.*

A Chance for Prospectors.—There is, perhaps, no more promising field for the prospector than that belt of mineral country lying between Carson and Patterson district (Sweetwater), of which the Mountain house is about the center. It has never been half explored, having been merely skimmed over by men who, for the most part, hardly knew what they were looking for. Daily reports of good finds come from that section, which will, perhaps, one day be the scene of thriving mining operations.—*Reno Gazette.*

It is said that the Bodie company has recently purchased for $5,000 some Comstock machinery that cost $120,000.

Colony of Redlands.

The writer, visiting Redlands in the latter part of March last, was very much impressed with the superior advantages this colony seems to possess. The lands are situated at the extreme end of the San Bernardino valley, where it narrows and rises upon the very flank of the grand old San Bernardino mountain. The altitude corresponds with that of the highly favored mesa lands, which are famous for producing the choicest, fairest and earliest of citrus fruits; table, wine and raisin grapes.

No one can fully realize the superior charms possessed by this colony without viewing its beautifully elevated position. Nearly every lot has a delightful outlook upon the bordering hills and mountains, and the towns, plains and cultivated lands spread out before its lawn-like, sloping front.

When the squares between the grand avenues, laid out in the published map, are improved and highly cultivated, as there is every reason to believe they soon will be, the view of the colony itself, from the very sloping position it occupies, promises certainly a more charming picture than that of any of the most favored colonies, preceeding Redlands in the calendar, on the coast.

A scene of great activity prevailed in laying out the wide and sightly avenues, building the reservoirs and latest improved system of water-pipes and distributing gates; manufacturing upon the ground, at different points, an immense amount of durable cement water-pipes, ranging from 4 to 24 inches in diameter; laying pipes and breaking up new ground. Altogether it was such an outdoor industrial show as but few persons view in a lifetime, and one that seemed to reflect great credit upon its projectors and enterprising managers.

Realizing the importance of a right start in colony building, Messrs. Judson & Brown determined to invite the best class of settlers only to Redlands. They wish to protect the town, laid out for its business center, from intrusion of intoxication dealing saloons, with their associated evils and trouble-dealing accompaniments.

The strength of this colony will be greatly advanced by thus associating a band of worthy settlers who will firmly co-operate in worthy undertakings only, and stand by each other in sustaining the good social and business reputation of the community.

Taking advantage of the experience of earlier colonies, we do not see why it should not be demanded that Redlands shall, in many particulars, be an improvement upon others. In another column will be found a more minute mention of this worthy enterprise, published by the representative press of Riverside, in this same county.

Alaska Mines.—A correspondent of the *Post* says: The mines of Alaska are as yet undeveloped, and the interior of the country has not been explored sufficiently to show what may be discovered in this line. Reports, however, have come from all sections of the country of immense deposits of precious metals. Reports came a few years ago of what was termed "a mountain of silver," discovered in northern Alaska. Specimens of this ores were brought to San Francisco by the discoverers, and, upon being assayed, gave such satisfactory results as to lead to the organizing of an expedition, which sailed from San Francisco last spring in pursuit of the treasure. The expedition reached the object of its pursuit and was a success, so far as finding the promising lode was concerned; but the vessel was wrecked with her cargo of ore as the party was preparing to leave for San Francisco. Having stopped on this coast for wood and water, she was caught in a southwester and driven upon this beach. The prospectors, excepting three, finally reached San Francisco at different times, some being picked up by trading vessels, and some securing passage on the revenue cutter, *Corwin*. They have told their tale. But little has reached the public of their adventures in this new field of wealth. Alaska to-day offers inducements to the able-bodied, energetic and thrifty, to make money by hard licks and perseverance. I believe the day will come when fortunes will be taken from her mines alone. Her mines will be the means of developing this country, which should be done and encouraged by our Pacific coast people, bearing in mind that it should be legitimately done. We are not in a condition to have an excitement brought upon our people, no matter what the mines may show, and Alaska, at present, is not a country to make a rush to. Let's take hold of these things slowly, and I think good results will come from our labors.

George I., King of Greece, is, perhaps, the most unpopular monarch in Europe. He seldom visits any public assembly or institution, or manifests any interest in public affairs, but gives almost undivided attention to his farm and horses. His subjects think that he regards Greece merely as a rented estate, out of which he is striving to make as much money as possible while his tenure lasts.

It is stated that the Catholic clergy of London are about to commence preaching a crusade among the Irishmen of their flocks, against connection with secret societies.

A New Educational Institution.

The educational institutions of California are a credit to the Pacific coast. Our public schools are unsurpassed, and the liberality of the people toward them is proverbial. There is also a group of most excellent private schools and seminaries, to which young people are sent from all parts of the coast.

The newest of the private institutions is the Harmon seminary for young ladies, at Berkeley. It will be a new school in a bright new building, but it will be in charge of Rev. S. S. Harmon and Mrs. F. W. Harmon, educators who for more than 30 years have been known by their works in different parts of the State. This institution is to be a quiet, home-like school, which will endear itself to the affections of the pupils, and which will in turn benefit them by the influence of home guidance and guardianship, as well as by the weightier matters of the classroom. As shown in the engraving, the front portion of the building rises three stories, and is about 50x60 ft. upon the ground. Back of this is the central portion, 30x100 ft., two stories high, with a two-story projection in the rear 20x32 ft. Upon the left of the main hall are the reception-room and two music-rooms. Upon the right is the large school-room. The ground floor of the central portion of the building contains the dining-room and four recitation-rooms, with cloak-room and side entrance for day scholars. The ground floor of the rear projection is devoted to the culinary department. The upper floors, aside from music and art-rooms, will be chiefly devoted to scholars' apartments.

It is the purpose of Mr. and Mrs. Harmon, and those associated with them, to establish an institution for young ladies which will be first-class in every particular. It is expected that the work of the seminary will arrange itself in several departments. The institution will be complete in itself, in that it will have a regular course of instruction, for which diplomas of graduation will be awarded. It will also embrace a department of instruction with a special reference to the preparation of young ladies who desire to enter the State University. In addition, there will be a conservatory of music and courses of instruction in the fine arts, modern languages and *belles lettres*, in each of which will be secured the services of masters of recognized superiority. In all courses there will be a disposition to place the institution abreast of all true progress in the art of instruction and the choice of studies for the curriculum. The first term will open August 3, 1882.

Mexican Mines.—A correspondent of the *Bulletin* says: Mining property continues to be sought for, and several parties are here from California purchasing, among whom may be mentioned F. A. Benjamin and Dr. Goodfellow, as also Prof. Cox, late of the State Geological Department of Indiana, who goes out to Barranca to examine that district in regard to coal. Quite a stir has been created here by the discovery near Llanos of a very rich gold mine by Dr. Detwiler, one of the grading contractors, and some others. From a sample shown me, I think it fully equal to any free-milling ore I have so far seen. As no great amount of work has as yet been done on it, the future is uncertain; but from the statements of the discoverers and the nature of the ore, it bids fair to rival, if not excel, the Minas Pristas. The shipment of treasure per steamer this month is small, owing to the non-arrival of any treasure from Pinos Altos, the bulk of the shipment being from Minas Prietas, now under the superintendence of H. A. Johnson. Louis Hollu, of Cumarepi, is in town, and it is understood that he has secured capital to open up the silver and copper mines of that district held by him. Quite a large amount of machinery and mining stores came by the *Mexico*, and go forward to Pinos Altos, the Carmen or Guiguipe mine and Minas Pristas. Captain Wm. Randall's mine, the Amarillas, is also opening out well, and will be soon in a producing state.

Better Times in Inyo.—Though no big mining sales are to be chronicled, nor has "capital" ordered the inauguration of any gigantic mining operation, through which quantities of this needful may become plentiful in our midst, there are several little mining operations in hand which together must in due time tend materially to ameliorate some of the generally prevailing pangs caused by the unprecedented scarceness of coin and other grub collaterals. These are that, within the present month there will be two furnaces and probably seven quartz mills in operation. Two of the latter are entirely new additions to our bullion producing resources; in fact, all but one or two are new in the field, since, with the exceptions referred to, it has been months or years since any of them have done anything in that line. The furnaces are the Defiance and Modoc; the mills are the Panamint, Keeler, Key-not (or Taylor), Laura, Brown Monster (5 of its 30 stamps), Rex Montis and Pioneer. Though two of these mills are running on tailings only, and some of the others are using but a portion of their stamps, the equivalent of stamps in actual operation will not fall short of 40, to which the furnaces and several arastrae are to be added. It has been many a day since this county could boast of having such a number of reduction works in operation at the same time, the remainder of this month being considered as the "present time."—*Independent.*

Smelters and Mills in Butte.

A short time since we took a short item from a letter in an exchange which gave the number of smelters, mines, etc., in Butte, Montana. The *Inter-Mountain* corrects the items as follows:

Of smelters there are four instead of three in the Butte district. They are owned by the Montana & Colorado Co., the Parrot Co., the Bell Co., and the Montana Copper Co. They have a total capacity to treat 200 tons of ore daily.

Of mills, we have the new Alice, 60 stamps, and the old Alics, 20 stamps; the Silver Bow, 30 stamps; the Moulton, 40 stamps; the old Lexington, 10 stamps. Besides the above, which are all in operation, we have the Lexington, 40 stamps, which will be finished in a few weeks, and another of the same capacity is soon to be erected by the same company.

The Dexter mill which has been idle some time will soon resume operations on high grade ore. The Clear Grit will soon begin the erection of a 20-stamp mill, and during the coming season Haggin & Tevis will most likely put up a smelter for the Anaconda, as will also the Original Butte Co.

In relation to concentrators, the Press is also misinformed. Instead of one concentrator there are three, and at least two more will soon be erected. The Williams concentrator, near Rocker, has a capacity of 50 tons per day, is provided with the best of machinery and is in highly successful operation. An *Inter-Mountain* reporter was all through the works last evening and was much impressed with the amount of ore on hand. The Longmaid concentrator near the depot is also making a good record. It consentrates 40 tone of ore per diem.

The Bell Co. will erect a 10-ton concentrator at the earliest practicable moment to treat the thousands of tons of low-grade ore on hand. A very successful concentrator is running in the Centennial mill and the owners of the Liquidator propose at an early day to put in another concentrator in the Clipper mill.

With these trifling exceptions the information published in the Press is entirely correct, and it is sincerely to be hoped that our estsmed contemporary will make the necessary corrections. The Press has ever been well disposed towards Montana.

Ore Concentration.

"A New Era in Working Sulphuret Rock" was the heading of an article, which, during the editor's absence, got into this paper of August 14, 1880. In looking over the figures they show evidence of being nothing but guesswork, and that there was no attempt at regular sample work. For instance, the statement occurs that in the work of the Frue's "assays of ore, that went as high as $200 and even $300 per ton, have yielded not more than from $30 to $40 per ton," and that such quality as yielded $25 per ton, yielded $100 per ton by chlorination. In the first place, it shows only 14% saved by amalgamation and concentration. Now, if this is not a mistake, it will be easy enough to show or convince any mining man that the statement of the chlorine work was merely guess work. "Such ore of the same quality, as heretofore paid $25," representing 14% of its value, would make the assay value of the ore $178.57; $100 would only be 55%, which would be too much less than the 90% and 95%, which they do get. Evidently, the article was directed against the Frue through ignorance. We write this, knowing that the whole thing can be shown to be a mistake—in which the two processes are shown to do very poor work, and wish to call attention to the fact that the Frue concentrator has saved twice the money over any other concentrator machines on the ores of this camp. As to the per centage shown in this article, we will state that the Frue has taken 97½% from $42 pulp after amalgamation on copper plates in one of our own mills, by parties not interested in the sale of the machines. Any one wanting proof of this can find it right here at home. Since writing the above, we learn positively that the gentleman giving the information upon which was based the article in 1880, admitted upon reading it next day that he had unwittingly given the reporter the wrong figures.—*Nevada Transcript.*

The official statement of the Homestake mine for the first quarter of 1882. is as follows: The net bullion proceeds were $286,322, and the expenses, including $10,523 as taxes, were $170,398, leaving a net profit of $115,924. Out of these three dividends were paid, amounting to $112,500, leaving a surplus of $3,424, which, added to surplus on hand December 31, 1881, $297,975, showing a surplus March 31, of $301,399.

Says the Reno *Gazette:* No place on the coast presents so many advantages as Reno for profitably running ore reduction works on a large scale, and when the Nevada and Oregon railroad is completed to the north, and the Carson and Colorado has tapped the base rangs of Inyo county, capital, without doubt, will note these advantages and seek investment here.

For the week ending May 8th, the Father de Smet mine yielded 2,375 tons pay ore from the first and second levels. In the 200 ft. of tunnel extended from the McGinty chamber a new body of good ore has been cut.

Smelting Furnaces for Wood River.

Appliances that will Insure Success in Treating our Ores.

The Pacific Iron Works, Rankin, Brayton & Co., of San Francisco, have recently shipped a 40-ton smelting plant to the Philadelphia Co., at Ketchum. This, with the smelter and sampling works constructed by this firm for the same company last fall, makes a capecity of 80 tons per day. The same firm have also just completed an 80-ton plant for the Wood River company, to be erected at once on the Muldoon mine. Both these enterprises are owned and operated by the Philadelphia companies, under the general management of Colonel Green, a gentleman of large expsrience in mining operations in California. No expense has been spared to make these worke the most perfect and complete in all their appointments of any that have been constructed. The amount of bullion they will turn out when fairly in operation will convince the most skeptical as to the resonrces of the Wood River country. The Pacific Iron Works' smelters, for both galsna and copper oree, have worked a revolution in the smelting business of the conntry, and have made success of many an enterprise that would otherwise have been a failnre.

The advantages demonstrated in these furnaces are facility and cheapness of transportation and construction, economy in fuel, fineness of bullion prodnced, and capscity for continuone and uninterrnpted work. Any ore that can he emelted, it is claimed, can he worked cheaper in these farnacee than hy any other process.

The mining interests of the country are largely indebted to the enterpriee of this firm for working up to snch a state of perfection this important branch of mining machinery. A large nnmher of companies in Arizona, New Mexico and Nevada are operatiog these furneces with the most satisfactory results. And we feel assnred that nothing will insure the snccess of our various smelting enterprises so much as the general adoption of these approved appliances for treating ores.—*Wood River Times.*

MINING ACCIDENT.—On Monday last, in the face of south drift No. 2 of Union five holes were drilled and charged. One hole was charged three times before an explosion occurred, and then it did not result, as desired, in blowing ont the rock. The relief shift, composed of Richard Hicks, John Beargo, John Bleck and James F. Brown, again charged the holes. Hicks end Bsargo had finished their work on the west side, and Black and Brown were cbarging those on the east. Hicke was gathering up the toole to convey them beyond the reach of the blast, when an explosion occnrred which immediately killed Black and Brown, seriously wounded Bsargo and filled the flesh of Hicks witb the flying splinters. Brown's body was torn to pieces; Beargo was fearfully lacerated with flying rocks, sbattering his sknll, the pnlsation of the brain being visible. Hicks being much nearer the bulkhead behind which they would find shelter, received injuries less severe than those of hie companions, and was enabled to walk home. The cause of the accident is not known, but the most plausible theory is that the hole repeatedly charged contained a cap, and exploded hy the later tamping.

POLISHING SHELLS.—Spon gives the following fecte respecting the methods employed for polishing shells: 1. Marine shelle are cleaned hy rnbbing with a rag dipped in ordinary hydrochloric acid till the outer dull skin is removed, washing in warm water, drying in hot eawdust, and polishing witb chamoie leather. Those shelle which have no natnral polished surfacs may either be varnished or rubbed with a little tripoli powder and tnrpentine on wash-leather, tben fine tripoli alone, and lastly witb a little fine olive oil, hringing np the surface witb chamois as before. 2. The shells are first boiled in a strong solntion of potash, theu ground on wheels, sometimes through one etratnm, to ehow an underlying one, then polished with bydrochlorio acid and putty powder. In tbie operation tbe hands are in great danger. · Shell grinders are generally almost cripples in their hands. 3. Polishing motber of-pearl—Go over it with pnmice stone finely powdered (washed to separate the impuritiee and dirt), with which polish it very smooth; then apply pntty powder and water hy a rubber, whicb will produce a fine gloss and good color.

PLAIN TALK FROM WOOD RIVER.—A correspondent of the Eureka *Leader* writes as follows in regard to the outlook in the Wood River conntry: Next year may bnd furnaces, smelters, eaw-mills, etc., enongb in this country to make it a really lively district, but nntil snch time I would warn all *poor* people to let Wood River alone. There are to-day 150 men here to one job, and before another month 200 men will be ont of work, and money also, to one man working. Snch is the outlook. Onr merchante and bneinece men all wonder what the trouble is; hut they do not take the time and tronble to think a few moments in a eensible way. Bueinese ie not what we desire it should be, nor what we expected it to he. Many people are coming in daily, hut they all come broke, and this ie what is tbe matter with Wood River. I may he slightly censured hy eome of our "flighty" hueiness men, hut it is true, "and don't you forget it." We have enough bueiness bouees in Bellevne and Hailey to supply a city of 50,000 people. And etill they all kick hecaute tbey do not make anything.

Useful Information.

A NOISY MONKEY.—One of the most extraordinary and the largest of all the monkey tribee fonnd in America is the "howler monkey," so oslled from the loud voice of the males. A. R. Wallace, in the *Popular Science Monthly* for May, alludes to this animal as follows: Often in the great forests of the Amazon, or Orinoco, a tremendous noise is heard in the night or early morning, as if a great assemblage of wild beasts were all roaring and screaming together. The noise may be heard for miles, and it is londer and more piercing than that of any other animals, yet it is all produced hy a single male howler sitting on the branchss of some lofty tree. They are enabled to make this extraordinary ncise by means of an organ that is poesessed by no other animal. The lower jaw ie unusually deep, and this mekes room for a hollow bony vessel about the size of a large walnnt, situated under the root of the tongue, end having an opening into the windpipe by which the animal can force air into it. This increases the power of its voice, acting something like the hollow case of a violin, and prodncing those marvelous rolling and reverberating sonnds which csused the celebrated traveler, Waterton, to declare that they were such as might have had their origin in the infernal regions. The howlers are large and etout-bodied monkeye with bearded faces, and very strong and powsrfully grasping tails. They inhahit the wildest forests; they are very shy, and are seldom taken captive, though they are less active than many other American monkeys.

TO CLEANSE A SOILED CHAMOIS LEATHER.—Many workshops contain a dirty wash leather, which is thrown aside and wested for the want of knowing how to clean it. Make a solution of weak soda and warm water, ruh plenty of soft soap into the leather and allow it to remain in eoak for two houre, then rub it well until it is quite clean. Afterward rinse it well in a weak solution compossd of warm water, soda and yellow soap. It must not he rinsed in water only, for then it wonld he so hard, when dry, as to be unfit for use. It is the small quantity of soap left in the leather that allowe the fiber perticles of the leather to separate and become soft like eilk. After rinsing, ring it well in a rough towel and dry qnickly, then pnll it about and brush it well, and it will become softer and better than most new leathere. In using a rongb leather to touch up highly-polished surfaces, it is frequently obeerved to scratch the work; this is caused hy particles of dust, and even hard ronge, tbat are left in the leather and if removed by a clean rougy brush it will then give the brightest and best finieh, wbich all good workmen like to see on their work.

DANGER FROM OILED FLOORS.—The dangers attending oiled floors and seats in public buildings appear to have been illustrated in the recent destruction of Walker hall, one of tbe Amherst college huildings, whose floors had been oiled only the day hefore. The danger is not so mucb in saturating the woodwork, hnt in the waste used in performing the opsration, which careless workmen are liable to leave hehind them. The Springfield *Republican*, in speaking of thie fire, relates, also, another instance: That some yeare ago, contractor Johnson, who built the Northampton First church, and many other similar edifiose in the Connecticut valley, "had an impression" one evening that something was not right ahont a church he was finishing, the pews of which the workmen had heen oiling that day; so he went to the building and nnlocked it to find that flames were jnst breaking out near the entrance of the andience room. Wben one of the men left work at eix o'clock he laid the piece of cotton waste, which be had heen using, on the rail of the last pew, and the resnlt was spontaneous oombustion in three or four hours.

THE USE OF SHARK SKINS.—The skins of certain sharke are nsed in jewelry for sleeve bnttone and tbe like, and when dried and cured take a polish almost eqnal to tbat of stone, and greatly resemble the foesil coral *porites*. The vertebrae of tbe shark are always in demand for canee. The opening filled with marrow dnring life is now fitted with a steel or iron rod. The side openings are filled with motber-of-pearl, and when polished the cane is decidedly ornamental. In India, in 1880, $300,000 worth of shark fins were shipped to China for food. In the islands of tbe Pacific the fish is in great demand for its teeth, which are manufactured into weapone of various kinde, ranging from spears to sworde and daggere. The teeth are all serrated or saw-edged, and make terrible wounds. The hase of tbe tooth ie bored with eome small instrnment, and 40 to 50 of them are tied or laebed to a hardwood sword, forming the edge. The hilt ie also protected hy croespieces armed in the same way. So effective are theee weapone that the natives of these islande wear an armor made of rope especially to protect themselves from the shark's teeth.—*Sea World.*

A MICRO-TELEPHONE has heen used with success in discovering underground water-courece in the Tyrol. By the way, may not thoee persone who ueed "divining rode" to discover where wells conld be dug have heen posseseed of an nnnsually eensitive power of bearing, whicb enabled them to detect the gurgling of water deep down in the earth, and simply employed a willow wand as a "hlind."—*Invention.*

A PUBLIC LIBRARY WITHOUT NOVELS.—In Germantown, a part of the suburbs of Philadelphia, there is a free library of 10,000 volnmes without a novel in it. When the librarian was asksd, "Why don't you keep novels?" he replied: "Because we hold that it does harm to our young readers. Fully one-half of those that come here are young folks. Novels, at that period, are not the things for them. We hold that their minds should be led to take up some more wholesome reading—hooks on travels, or natural history, or biography—something that will amuse and instruct together." "Is there any diseatisfaction because you have no novels here?" "No, we have from 400 to 600 visitore a week, snd they increase every yeer. We have books on all sorts of trades—erchitecture, engineering and carpentering. We find these books are a great deal read, and have not the least doubt ae to their usefulness."

MUCILAGE.—Persons are often at a loss for a very strong mucilage, having sufficient power of tenscity to fasten sheets of pastehcard together. The following cement is recommended by a scientific authority: Melt together equal parts of pitch and gutta perche. To nine parts of this add three parts of boiled oil and one-fifth part litharge. Continue the heat with stirring until a thorough union of the ingredients is effected. Apply the mixture hot, or somewhat cooled, and thinned with a small qnantity of benzole or turpentine oil.

POTATO FLOUR.—Potato flour, or the dried pulp of the potato, is attaining considerable importance in the arts—so much so, in fact, that in Lancashire, England, some 20,000 tons of it are sold eunually, and its market value is etated to he much greater than that of wheat flour. The article is extensively used for sizing and other manufacturing purposes, and, on being precipitated with acid, is converted into starch. After having been calcined it is used with advantage as a dressing for silk.

CEMENT.—Lovel, in Paris, has patented a method for the manufacture of cement, by mixing magnesia with tbe crystallized sulphate of magnesia and moistening the mixtnre with water, also by mixing the magnesie with a solution of the sulphate of megnesia.

POISONOUS COSMETICS.—A young lady recently died in Boeton from poisoning with cosmetics containing lead. Sucb cases are not rare. It ie time we had a law against tbe manufacture of such articles.

DISINFECTANTS.—"What ie the action of disinfectants?" was asked of a medical student. "They smell so bad tbat people open the door, and fresh air gets in," was the reply.

PATENT MEDICINES IN FRANCE—In France all patent medicines must be indorsed hy an official board of physicians before they can he sold.

Good Health.

Hereditary Disease.

There is, strictly epeaking, no such thing. Children are not born diseased (some specific maladiee excepted), even if one or both parents are, but they are simply born with a predisposition to such parental malady. They are born with the material, witb the powder, hut actual disease will no more occur, unless exciting causee are applied, than powder would detonate without the aid of fire. The observaot reader has often felt surprised at seeing robust, hearty children, of parents who were seemingly at not a great remove from tbe grave; and, if rational care were taken of sncb children, tbey would live to become healthy men and women. The practical lesson should he, a hopeful diligence in the rearing of children of diseased parentage. The difference between the ohildren of healthy and diseased parents amounts to this: As to tbe latter, tbe powder is drier, they have less capability of resisting the causee of disease; the consequence is, a greater neossity for carefulness; tbis necessity is often felt and practically attended to. The result is, tbat such persons are found living, scores of years after they have moldered in tbe grave, who, in priding themselves on baving constitutions which nothing could hurt, could not be made to feel the need of carefulness, and, consequently, perished long before their prime.

We have an instructive and royal illustration in point, in the persons of Queen Victoria and her children. Intermarriage with hlood relatione for agee hae deeply impregnated the Guelph family with scrofula. The earlier years of the Britieh Queen were spent in feeblenese and disease, and yet she is now the apparently healthy mother of a large family of robuet, healthy children, which is at once creditable to herself, and to tbe medical skill wbicb dictatee the hygiene of her houeehold. Tbe daily rontine of these children ie, to rise early, breakfaet at eight and dine at two. First hour after breakfast, the classics; next, the modern, grammatical instruction being also carefully given; next, military exercieee for the boys; tben mueic and dancing; then the riding school; music and drawing for the girls; then the carpenter's shop, and, occasionally, the laboratory; then ebooting and working in tbe royal gardens; then eupper; then prayers, and then to hed.

Reenlt, high bodily health, in spite of agee of *"hereditary tendencies"*—*Hall's Jour. of Health.*

Instructions by Which We May Keep from Drowning.

The human body weighs a pound in the water, and a chair will carry two grown persons. That is, it will keep the head above water, which is all that is necessary when it ie a quee-tion of life or death. One finger placed upon a stool or chair, a small box, or a piece of board, will easily keep the head above water, while the two feet and other hand may be used as paddles to propel toward the shore. It ie not at all necessery to know how to swim to be able to keep from drowning in this way. A little experience of the buoyant power of water, and faith in it, is all that is required. We have seen a small hoy, who could not swim a stroke, propel himself back and forth aoross a deep wide pond by means of a board that would not sustain five pounds' weight. Children, and all others, should have practice in the sustaining power of water. In nine cases out of ten, the knowledge that will sustain a pound weigbt is all thet is necssary to keep one'e head above water, and will serve better in emergenciee than the greatest expertness as a swimmer. A person unfamiliar with the buoyant power of water will natnrally try to climb on top of the floating object on which he tries to save himself. If it is large enough, that is all right. But it is generally not large enough, and half of a struggling group is often drowned in the desperate scramble of a life and death etrnggle to climb on top of a piece of wreok or other floating object, not large enongh to keep them all entirely above water. This often happens when pleasure boats capsize. All immediatsly want to get out of the water on top of the overturned or half-filled hoat, and are all drowned except those whom the wrecked oreft will wholly bear up. If they would simply trust the water to sustain .99 of the weight of thsir bodies, and the disabled hoat the otber hundredth, they might all he saved under most circumstances. An overturned or water-filled wooden boat will sustain more people in this way than it will carry. It would keep the heeds above water of es many people as could get their hande on the gunwale. These are simple facts, eesily learned, and may eome day save your life.

A Cheap and Serviceable Filter.

A cheap and serviceable filter may he made by the following method: Take a large flower pot, or earthern vessel, make a hole one-half inch in diameter in the bottom, and insert in it a sponge. Place in the bottom of the vessel a numher of clean stonee of sizes varying from tbat of an egg to an apple. Place upon thie a layer of much smaller etones and coarse gravel. Then fill the jar withia two inches of the top, with equal parts of pulverized charcoal and sharp sand, well mixed. Place loosely over the top of the jar white flannel cloth, allowing it to form a hollow in the middle of the jar, into which tbe water can be poured. Secure the edges by tying a stont cord aronnd the outside of the jar. By keeping a suitable vessel under the filter thue made, and snpplying rain-water when needed, very pure water can be obtained. It can be kept in a cool place in the summer. It will reqnire to be renewed occasionally by exchanging the old eand and charcoal for fresh. Tbe flannel and sponge must be frequently cleansed.

Such a filter, if allowed to become empty every day, or evsry other day, at least, ought to last several years. Water which has a distinct odor should never be passed through a filter. Filtration will not purify such water.

The hardnsss of hard water is not removed hy filtration. If a charcoal filter is employed, some of the mineral ingredients of the water will be retained in the filter, but no very considerable proportion. The use of bard water will very soon spoil the best filter made, by the deposit of lime.—*Good Health.*

EFFECTS OF LAGER BEER ON GOATS.—Recently some Pennsylvania beer sellers tried tho effects of beer on a goat. Whether the experiment was for tbe purpose of determining the quality of tbe beer, or the constitutional toughness of tbe goat, is not recorded; but the result was fatal to the goat, notwithstanding the hardihood for wbicb he is proverhial. Jnst how many glasses were required to extinguish him is not mentioned; but he died, and the bigh quality of the beer was established beyond tbe possibility of cavil. But this is not the end of tbe story. The Humane Society learned of the proceeding, and immediately began an action against the heer venders for cruelty to animals. The action was undoubtedly jnetifiable, hut is a matter of wonderment that the same law-makers who bave found it an offenee to kill goats with beer, have never once thonght of its being a crime to destroy human beings by the eame means, altbough there are abundred thoueand human beings sacrificed by tbie means, to one goat. It is to be hoped that the question of prohibition will be agitated until human beings are, at least, as well protected as goats.

COPPER IN BREAD.—The author concludee that wheat normally contains copper to tbe extent of eight to ten parts per million. He has experimented with grain, the seed of which had not been "pickled" with sulphate of copper (as ie often done to prevent smnt), and has eatisfied himself that the copper was not dne to any impurity in hie reagents, or to the gas pipes and hurners.—*Jules Van Dens Berghe.*

MINING AND SCIENTIFIC PRESS

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SAN FRANCISCO:

Saturday Morning, June 24, 1882

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Passing Events.

The result of the debris decision continues the leading topic among mining men interested in California mines. No steps have yet been taken towards an appeal. The large mines will immediately begin to prepare for impounding their debris. The Government has appropriated $250,000 toward improving the Sacramento and San Joaquin rivers.

The party from the burned Arctic exploring ship *Rodgers* has arrived safety at Sitka. Master Putnam, who volunteered in place of Master Halsey, lost his life by being carried to sea on an ice-floe.

The burning of the end of the old Oakland pier, with the destruction of one ship and damage to others, is a local event furnishing some excitement.

Another mining expedition started from this city to Alaska this week. The men composing it, having been up there last season, know what they are going after.

The loss of the British steamer *Escambia*, on the bar outside the Golden Gate, is a circumstance of unusual importance. She was apparently overloaded, and turned over on a sea boarding her, some 26 lives being lost, besides the costly ship and valuable cargo. The ship is represented as having been faultily constructed, as she heeled down on her side badly whenever it blew, and her solid bulwarks held so much water on deck as to make her dangerous to handle at sea. A consular inquiry is being made into the cause of the event.

The discovery of nickel ore in Oregon is an event of great commercial importance, and one which is more fully referred to in another column,

The miners in the different States and Territories are moving in the matter of the Denver Mining Exposition, but so far, nothing has been done in this State.

This number of the PRESS is the last of volume XLIV.

Close of the Volume.

This number closes Volume XLIV of the MINING AND SCIENTIFIC PRESS. Those of our readers who have been such since the commencement of the volumes will remember the scope and variety of its contents. Those who have only seen a few numbers can, by a glance at the index which fills the last page, see an "abstract by title" of all we have presented to our subscribers during the past six months.

We flatter ourselves that no mining paper in the United States has furnished more practical information to practical miners than the PRESS has. Moreover, we have presented each week a condensed and comprehensive report of current news from all the Pacific States and Territories, mining notes from all regions, districts, camps and mines in every direction. And this is in addition to the mechanical, scientific and general information the paper has given. We have spared no trouble in making the PRESS as interesting and valuable as possible.

We propose to continue to do this during the coming volume and those which will come after it. We need, however, the co-operation and assistance of practical miners and progressive mechanics and artisans everywhere. We need their help in more ways than one.

We hope that this will be considered a good time to renew subscriptions; and also that those who see this number of the PRESS, and who are not already subscribers, will send in their names. All mining men and mechanics on the coast should support their home paper.

The Denver Mining Exhibition.

We notice by our interior exchange that in some of the most prominent camps attempts are being made to get up collections of geological and mineralogical specimens to forward to the Denver exhibition. The main difficulty seems to be the lack of money to pay some individual to collect the specimens and go with them to the exhibition. The different appointees, from the various States and Territories, seem to be expected to pay their own expenses as well as do the work.

The fact of the matter is, it takes good hard work to collect specimens for such a purpose. People generally are apathetic and need constant reminders. Moreover they need personal solicitation or notice, and even then the Commissioner must do the labeling, packing, etc. When all this has to be done without pay, and at one's own expense, it is hard to find men to do it.

Governor Murray, of Utah, has appointed Prof. J. E. Clayton as Commissioner from that Territory, and as that gentleman has a large private collection of his own which he will exhibit, and will take several other private collections, Utah will make a good show.

Governor Sheldon has selected W. B. Sloan as Commissioner from New Mexico. Governor Tritle, of Arizona, has chosen Prof. Church to represent that Territory. The county of Cochise is to be represented by Hon. Patrick Hamilton, and Tombstone district by Theo. R. Sorin.

Oregon, Nevada, Washington, Montana, Idaho and California are still without commissioners, and no active steps have been taken in either one of these States or Territories for representation. The papers are urging the miners to come forward with specimens, but what is everybody's business is nobody's business.

The most proper person to represent this State would be the State Mineralogist. He is unable to leave, however, owing to lack of appropriations. The State Mining Bureau is so short of funds that the Mineralogist has now to do nearly all the work, and cannot, of course, close the Bureau and go away. Nor could he remove any of the specimens. We fear California will be poorly represented. There is now scant time, and so far no active measures have been taken. If the Governor appoints a Commissioner, that official must pay his own expenses in collecting specimens and his passage to and from Denver, besides his board while there. Under these circumstances it will be hard to find anyone to accept the commissionership. If anything is to be done in this State it must be done quickly, for it will be better to make no show at all than to make a poor one.

NON-ASSESSMENT MINES.—The Nevada *Transcript* says: Nothing is being done at the Fortuna mine. It is a good claim, but was incorporated under the laws of the State of New York, which prohibit the levying of assessments. The working capital gave out before the shaft was sunk to a respectable depth. I. M. Taylor, the chief manager, went East over a year ago to see what could be done about it, and he stated upon leaving that he expected to commence work on it again very soon. The "very soon" is still in the future.

IT is stated that the German government regards the small majority on the resolution adopted in the Reichstag, declaring inadmissible any further measure hurdening the tobacco trade, as an indication that the refusal of the Reichstag to accept the tobacco monopoly would not be permanent.

Nickel in Oregon.

At the last meeting of the San Francisco Microscopic Society, the first public and reliable notice was made of the important discovery of a large deposit of a rare form of nickel ore at a place about eight miles from the town of Canyonville, Douglas county, southern Oregon, and three miles from the Oregon and California railroad. The deposit closely resembles that discovered in New Caledonia, in 1864, as will be seen from an article on the subject in another column of this issue. Professor Liversidge, in 1874, read a paper before the University of Sydney on the "Nickel Minerals from New Caledonia," wherein he says: "These minerals consist of two hydrated silicates of nickel and magnesia, which are found in small veins and fissures, traversing the serpentine occurring at Mont D'Or, not far from the town of Nonmsa, New Caledonia. They are associated with chrome iron, steatite and other minerals commonly occurring in serpentine, and are seen disseminated through the loose blocks and bowlders of that rock scattered over the surface of the ground. The chief differences between the two minerals are found in some of their physical properties, for chemically they do not differ so widely; in fact, both forms contain nearly equal proportions of nickel; their other constituents, however, vary considerably."

In the "Transactions of the Royal Society of New South Wales," for 1876, is a lengthy notice by the Vice-President of that society on the deposits of nickel ore in New Caledonia.

In a pamphlet by Capt. A. E. Brune, lately published in this city, he says: "New Caledonia, discovered by Capt. Cook over 100 years ago, is, next to New Zealand, the largest island in the great South sea, being upwards of 220 miles in length and 40 in width. Its valleys and transverse plateaux contain large areas of transcendent fertility, teeming with spontaneous vegetation; yet, no product of this prolific island figures in the world's commerce, except its sandal-wood, gold, copper and nickel ore—the latter presenting itself in the form of a magnesium hydro-silicate, which has received the name of garnierite."

Dr. Hood has given the following comparative analyses of the Oregon and New Caledonia nickel ores:

	Oregon Ore A....	Oregon Ore B....	Garnierite.....	Noumea.....
Silica.....	48.21	40 35	47.23	47.90
Iron and Alumina oxide..	1.38	1.33	1.66	3.00
Nickel oxids.....	23.88	29.66	24.01	24.00
Magnesia.....	19.90	21.70	21.66	12 51
Water.....	6.63	7.00	5.26	12.73
	Amorphous—Hardness, 2.5; specific gravity, 2.65; color, pale apple green, becoming lighter by exposure. Adheres to tongue; not unctuous. Does not fall to pieces when placed in water.	Amorphous—Hardness, 2.0-2.5; specific gravity, 2.20; color, dark apple green, becoming lighter by exposure. Adheres to tongue; unctuous. Falls to pieces in water.	Amorphous—Hardness, 2.0-2.5; specific gravity, 2.27; color, apple green. Adheres to tongue; not unctuous. Falls to pieces in water.	Amorphous—Hardness, 2.5; specific gravity, 2.58; color, dark apple green. Does not adhere to tongue; unctuous. Does not fall to pieces in water.

The peculiarity of this rare deposit of nickel will be highly interesting to mining geologists, and we hope, ere long, to see works erected for its reduction in or near San Francisco, as the demand for this useful metal is daily increasing.

ALTA MATTERS.—The 2150 level has been cleared of debris and men have resumed work in the west drift. On going into the main east drift it was found that the center of the bulkhead was gone down to within two courses of timber from the floor of the drift. On the south side a considerable section of the bulkhead was still standing, and on the north a smaller amount. The bulkhead was built up of timbers about six ft. long, all in the shape of wedges or keystones, and about one ft. square at the large end. The bulkhead was in the shape of a segment of a circle, the arch being inward toward the water that it kept back. These timbers were well bolted together and embedded in cement. The sections remaining were found so solid that several blasts were required to throw them down. The site of this old bulkhead is being cleared and they are now cutting out for the new stone bulkhead. The stones used will be seven feet long, and each stone will he cut in the form of the keystone of an arch. Owing to the great pressure on the old bulkhead, the ends of some of the timbers burst open and split out like the splints of a wooden broom.

The Hydraulic Mines.

In the last number of the MINING AND SCIENTIFIC PRESS we gave the full decision of Judge Temple in the debris case. By this time its details are pretty well understood, and, of course, to the miners it was very unsatisfactory; but still its tenor is such that they can comply with its provisions by building retaining dams which will keep back the "howlders, cobbles and beavier sand." Quite a number of mining companies owning the large mines in Nevada and Sierra counties are already taking steps to impound the debris. The North Bloomfield company, of Nevada county, has already commenced the construction of a dam, to be some 40 ft. in hight, at the mouth of the canyon into which the company discharges its tailings. This will afford reservoir capacity to impound the debris from its mine for quite a length of time, and as the ground devoted to this purpose belongs to this company, it will have no further trouble in the matter, beyond the cost of the dam.

In an interview with Mr. Hamilton Smith, Jr., President of the Miners' Association of California, who has given the subject very close study and is thoroughly posted, he says:

"For the retention of debris upon a large scale, it will be almost necessary to have either State or Congressional action, as in many places the beds of the mountain streams are owned by river miners, and in order to devote these streams to reservoir purposes, the power to condemn their beds should be granted by legislative action. Should Congress pass the appropriation proposed by Mr. Page for the relief of the Sacramento river, the situation will be very much simplified.

"The restraint of debris coming in the future from the mines can only be thoroughly accomplished in conjunction with works for the restraint of the great masses of the debris now in the mountain rivers. Should Judge Temple's decision be confirmed by the higher courts, and should it be definitely decided that it is the duty of the miners to store their tailings, it will be their best policy to join forces with the United States engineers, so that the engineering works built shall answer the double purpose of holding back the debris now in the river beds, and also of impounding that which in the future may be washed into them.

"It is apparent that a final and speedy decision of this Gold Run case by our Supreme Court is most desirable for both farmers and miners, and we all hope that the law will settle it within a few months. It has all along been understood that, no matter what Judge Temple's decision might be, the case would be appealed at once, and doubtless the Gold Run company will carry out that understanding. The important thing for both of the contending parties is, that they should know exactly what the law is, so that they may know what future action to take in the matter.

"I most certainly believe that there is a practicable method by which the vast quantity of slickens and bowlders brought down by the present system of hydraulic mining can be effectually impounded. I have the most implicit faith in the ability of the miners to accomplish that very thing; but it will require an immense outlay of both money and labor. Naturally the miners will not feel justified in expending large sums in building dams, unless they know that these expenditures will insure immunity from further legal attacks. If they were once assured that they would not be molested in the future, they would have no hesitation in building works of the most substantial character.

"Some of the largest and most substantial dams in the world have been built in the mining counties of California, for the storage of water to supply the mines during the dry season. These dams are safe from breakage beyond peradventure, and if it be so easy to build dams 100 feet or more in hight to store water, it is surely much easier to construct dams which will safely hold back bowlders, gravel and sand."

THE DOWNEYVILLE STRIKE.—A correspondent of the Reno *Gazette*, writing from Downeyville, says: "This is the greatest mineral country in the world, I believe. The Downey mine, in Downeyville, on Friday, run a drift into a cave 150 ft. from the surface, the walls of which alone contain 2,000 tons of ore that will go over $500 to the ton. It is not known what is beyond this, but the ledge is supposed to extend for a mile very near the surface. The owners of the mine are going to put up another smelter. The one they now have has a capacity of 20 tons per day, and the other is to be of the same size. The whole country around Downeyville and Grantsville is already located, and prospectors are at work everywhere."

CHIEF OFFICER WATTS, of the American ship *Imperial*, from San Francisco, was arrested on his arrival at Queenstown, charged with wounding, with intent to kill, several of the crew of the American ship *Gatherer* on her recent voyage.

VESSELS of 1,000 tons will soon be steaming through the Welland canal. The work of enlargement was begun 10 years ago, and Canada has expended $13,000,000 up to date.

The Microscope in Metallurgy.

Nickel and Gold Ores.

In the MINING AND SCIENTIFIC PRESS of April 1, 1882, we published a paper by Melville Attwood, F. G. S., on the subject of the "Microscope in Metallurgy," which was read before the San Francisco Microscopical Society. We now append a paper by the same author which is a continuation of the former one, and which was read before the Microscopical Society at its last meeting:

In continuing the subject of "The Microscope in Metallurgy," I feel that I cannot urge too strongly on mill men the necessity of a more extended and general use of the microscope in their calling, particularly in special points of inquiry. Its importance in a matter which occurred last week I think well worth relating. Some time ago a discovery of a large and valuable deposit of a rare variety of nickel ore was made in Douglas county, Oregon. Nos. 1 and 2 are specimens of the ore, No. 2 having one side polished, after the manner described in a paper—the subject, "Porphyry"—that I read before the society. In this particular case the simple mode of preparing it, as you will see by examination, shows very beautifully the structure of the ore.

Rare Variety of Nickel Ore.

The value of the discovery attracted a great deal of attention, and induced a number of parties to search for that metal, and last week a specimen of rock (No. 3 and No. 4 section), with a number of assay certificates, said to be the results of trials from different pieces of the same rock by assayers in this city, was handed to me, no doubt in good faith and with the best intentions, the results, according to the different certificates, varying from 10% to 25% of nickel. The deposit was represented as being extensive and situated at a comparatively short distance from San Francisco, and the modest sum of, I think they told me, $2,000,000 was asked for the property. I gave a portion of the rock to one of the most reliable assayers here, who kindly agreed to try it for me, and at the same time I broke off another piece to have a section cut from it for microscopic examination. The return from the assay office was no nickel, and the examination by the microscope proved the correctness of the return from the assayer, showing, without a question or doubt, the specimen of supposed nickel ore to be nothing more nor less than a piece of common serpentine rock.

Analysis of a sample of nickel ore from Piney mountain, Cow creek, Douglas county, Oregon:

Nickel protoxide	6.14
Chromium sesquioxide	0.12
Magnesia and alumina	13.04
Silica	53 20
Iron sesquioxide	16.80
Water	10.70

The above was result of analysis of a mixed sample of five different rocks, including the serpentine wall rock. Subsequent analyses of selected ore give as high as 29.33 protoxide of nickel.

Through the kindness of Dr. Hood, I am not only able to exhibit to you a collection of the Oregon ore, but also the rocks and minerals associated with it, and an analysis by Dr. Hood of an unassorted sample of the deposit. The last report from the working of the mine was that they had exposed thousands of tons of the ore, which would yield from 10% to 25% of nickel, which would be worth from $400 to $500 per ton. The estimate of the value of ore is taken from published transactions of the Royal Society of New South Wales, 1876, wherein it states 20% nickel ore is worth about 2,000 francs per ton in Europe. The ore is a hydrated silicate of nickel and magnesia, resembling the new mineral "garnierite," met with near the town of Nonmea, New Caledonia, and found traversing serpentine rocks, associated with chrome iron, steatite, and other minerals.

Prof. Liversidge, University of Sydney, read a paper before the Royal Society of New South Wales, 1874, on "Nickel Minerals from New Caledonia," a copy of which I have placed amongst the specimens, for any of our society who feel interested in the subject to read.

Garnierite; new mineral. Amorphous. Hardness=2.0–2.5; sp. gr.=2.27; apple-green; adherent to tongue; fracture conchoidal; falls to pieces in water. SiO_2 47 236; Al_2O_3 + Fe O, 1.668; Ni O, 24.010; Mg O, 21.660; Ca O, traces; H O, 5.266=99.840.

Milling of Gold Quartz.

One of the principal objects of this paper, however, is to criticise the *modus operandi* in use at the quartz mills in this State, and to try and point out what I consider its errors, and to suggest a method of working which is likely to prove more profitable. From the most reliable information I can obtain respecting the milling of gold quartz in Europe, South America and Australia, it appears that the time required for the amalgamation of the gold in iron pyrites, or raw ore, called here sulphurets, whether treated in wooden barrels, or in arastras, is about 24 hours, and their loss in simple amalgamation in wooden barrels (under 4 %) does not amount to one-half of that sustained in the roasting, or first stage, in the process of chlorination of the gold sulphurets—unless the reports of the St. John del Rey, and other large companies for the past 40 years, and also that of the smaller works in northern Italy are false—all of which have been published from time to time, and no one who knows anything about English mining companies, and particularly those men in charge of such as the St. John del Rey company, would entertain for a moment.

Amalgamation for gold in barrels is not in use at any of the mills in this State, nor has it ever been fairly tried here.

Those who have carefully panned out samples, taken from the refuse or leavings after the chlorination process, will tell you, that the coarser particles of gold are not entirely extracted by that process, so that in many cases the lose of the larger particles of gold must be very great.

This process, under any circumstances, contrasts very unfavorably with simple amalgamation in barrels, the loss of gold being greater and the cost more than double.

The greatest error, however, in our milling for gold, is, I believe, the fine stamping of medium grade vein stone. As I have stated before, stamping ought to be conducted, like the cracking of a nut, if possible, to break the envelopiug shell and to free without injury the metallic kernel. The screens for sitting the stamped quartz are usually made of perforated iron

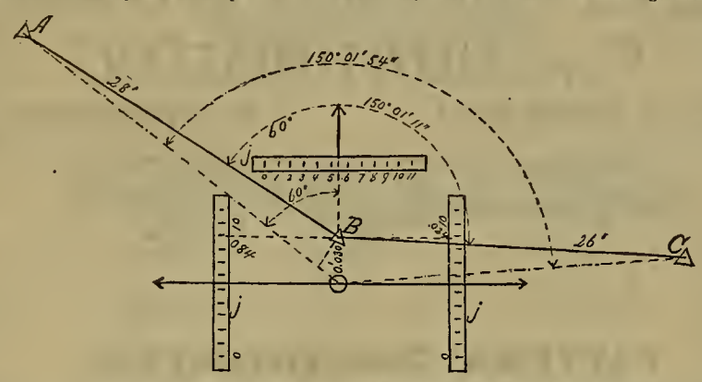

FIG. 2—APPLICATION OF THE MIRROR (See first page).

sheets; steel-wire cloth is better in many respects, as it allows more stuff to pass through in a given time, thus causing a saving in the cost of stamping, and also in the gold.

Steel-wire cloth with 144 holes to the square inch, which will allow grains having a diameter of one-fifteenth of an inch to pass through it, is not too coarse; indeed, if the vein stone contains much pyritic matter I would recommend 100 holes to the inch.

It will be found, when reduced to the above size, that if any gold with quartz adhering to it (say one-fifteenth of an inch in diameter) should pass through the screens, that it will be caught or saved on the blankets.

The screens in general use here reduce the pulp so fine that 80% of it will pass through a sieve having 2,500 holes to the square inch. Fine films of gold like those I exhibited at a former meeting, which were mechanically mixed with the iron pyrites, and the laminated gold, formed by unnecessary dead stamping, present so much more surface in proportion to their weight that they are carried away by slightly moving water, and easily dissolved by some of the so-called chemicals used in the pan process.

I have, mounted on slides, specimens of the Grass Valley (No. 5) and Bodie (No. 6) golds, the former as broken from the hard vein stone, and the latter the same as it is generally met with in the richer portions of the Bodie veins, occurring comparatively loose in a quartzose ferruginous matter, the larger portion of the quartz being in rounded grains (No. 7), and the gold mostly crystallized (No. 8). You will see by examination of the specimens brought for inspection, how great the loss would be in reducing it with a flow of water fine enough to pass through a sieve having 2,500 holes to the inch, or having a diameter of one-seventieth of an inch.

In amalgamation in the batteries, unnecessary dead stamping causes some of the amalgam to be battered and converted into a black mass, becoming mixed with the baser mineral, particularly so, should a small quantity of zinc get into the mercury, the magnetites and waste iron from the wear of the shoes, etc., would be coated with mercury; and the amalgam thus sickened, a large portion of it will pass over the silvered plates. (No. 10 sample from one of the Bodie mills.) I find the battery pulp, even without mercury in the batteries, but when a large proportion of pyritic matter is being treated, to have a decided acid reaction, due in a great measure to the presence of ferric and ferrous salts, soluble in water. The former of these salts destroys the action of the quicksilver, enfilming it with a compound insoluble in water, and preventing that metallic contact taking place between detached mercurial globules so necessary to amalgamation.

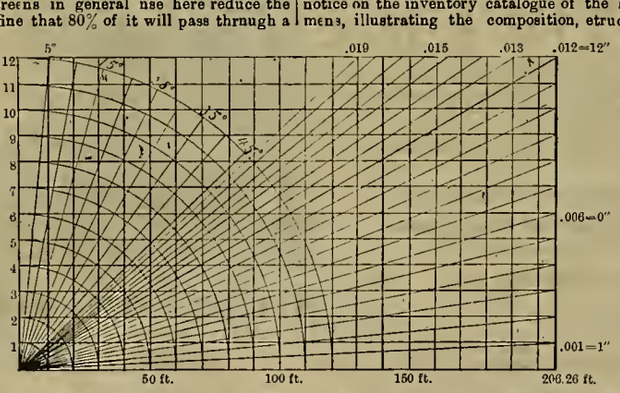

FIG. 3—DIAGRAM FOR REDUCTION TO CENTRE (0 001 feet in 206 20=tan. 1").

Alluvial Gold of New Zealand.

In 1876, Doctor Hector, Director of the Geological Survey of New Zealand, kindly presented me with a valuable and highly interesting collection of the alluvial gold of New Zealand. I mounted a few grains on glass slides, from 15 of the different samples, to be used for microscopic examination, and exhibited the collection at a meeting of this Society during that year, but as we have now so many new members who have not seen them, and wishing to awaken an interest amongst those of our society who have better opportunity than myself, and if possible, induce them to imitate Doctor Hector, and make a collection of the gold from the placers of California, as the excuse, if any be needed, for again showing them to you. I may add that a careful microscopic study of the collection will enable any one to tell the class of placere they were taken from; and if a collection of the characteristic gravels and bowlders met with in the different deep placers were also made, and sections cut from them for microscopic examination and determination, it would enable us to tell from what rocks they were derived—a matter of much importance to those engaged in alluvial washings, and much better than any paleontological guesses respecting them. In one of the old numbers of the *Mining and Smelting Magazine*, is a short notice on the inventory catalogue of the specimens, illustrating the composition, structure, and other characters of the Irish, British and foreign rocks in the collection of the Museum of Irish Industry, Dublin, wherein they remark:

"That great branch of the science of geology which Mr. Jukes, in his "Manual of Geology," defines as "geognoey," is the portion of real importance for industrial purposes. It includes the mineral composition and structure of rocks (lithology) and their physical relations, excluding all questions of age (petrology). To Mr. Jukes, the author of this catalogue, must he given the credit of having first, in this country at least, given due prominence to this branch of geology. Admitting the paramount importance of paleontology, and the arrangement of strata in a chronological series, it cannot be denied that geology has been prejudiced in the minds of practical miners by a too exclusive devotion to these subjects. It is, of course, ridiculous to rail at collections of "shells," but still it is natural that a man who knows nothing of paleontology should be impatient of that exclusive devotion to it which alone, for many years, passed for geology. When geologists turn their active attention to lithology and petrology, that is, the respective mineral composition and structure of rocks, and their physical relations on a large scale, we are satisfied they will find no more zealous or able coadjutors than this class of practical miners."

Milling Medium-Grade Gold Quartz.

As many of our members may not have seen the letter I addressed to the Mining Bureau on the milling of gold quartz, I will briefly state what I recommended in the milling of a medium-grade gold quartz. The screens should be of steel-wire cloth, having 12 holes to the linear inch. The bottom of the screen, when in place, should be three inches above the dies, and three inches horizontally from the dies. Each five stamps should have three sets of blanket-trays of the usualy width and depth—nine feet long altogether, but in three-foot lengths, with a drop of three inches between them, the blankets only covering two feet six inches of the upper part of the trays—inclination of trays from three to five degrees. The pulp, after passing over the blankets, should be brought by sluices to the middle tray, and a sluice trace of about four feet long should conduct the pulp, by two distributers on the right and left, to silvered plates three feet wide and two feet five inches long, made like stairs, with a tread of two inches, and the riser one-half inch inclined backwards under the tread. This form of plates has been used with great success in the sea-beach washing for gold. I am indebted to Dr. Hood, of this city, for the description of this form of plate. After leaving the plates, the pulp can be treated in Hendy or Frue concentrators, and the concentration reground, and then amalgamated in barrels. By this plan the present mills can be made to do double the work and save more gold, without increase of expenditure.

In conclusion, I can only repeat, that the microscope has been of special value in this instance, by enabling us to extend our powers of observation beyond the limits of our unassisted eyesight, and thereby aiding us to determine the condition of the gold in iron pyrites, so that mill men who feel so disposed can greatly simplify their treatment of gold quartz, and at the same time obtain better results.

The great difficulty in obtaining fair samples from vein stone carrying gold, renders the results from assays of it of little value; indeed, worse than useless. To it may be attributed the great number of failures in this branch of mining. I regret that I am able to say that I know of too many cases of failure entirely resulting from it, some of which occurred very recently, where men of good character, but utterly ignorant of mining, have been mistaken by assays, and induced to erect costly machinery on worthless mines, thereby ruining themselves and many of their friends.

Alaska Mines.

In the MINING AND SCIENTIFIC PRESS of November 12, 1881, was an article describing the mining region about Golowin bay, on the north coast of Norton sound, Alaska. The account was gained from an interview with Col. A. F. Williams, a gentlemen who had just returned from there, after prospecting the region referred to all summer, during which time the schooner that the party went up on was wrecked. The principal location made was a galena deposit, running 83% lead and some $160 per ton in silver.

Another vessel has been procured, the schooner *Leo*, and a party starts from this city Saturday to work in the mines, Col. Williams again going in charge. The company is called the "Alaskan Gold and Silver Mining, Milling and Trading Co."

A number of animals are taken up in the *Leo*, including a lot of horses and jacks, to be used in hauling ores and timbers for the mines, until such time as the company may complete a railroad 12 miles in length, which is now in contemplation. R. B. Hard, formerly Sheriff of Contra Costa county, is in charge as Superintendent of the mine. A. F. Williams, of Oakland, is President of the company. J. C. Green, of Oakland, goes up with the present expedition to lend his assistance. He will return in the fall on the *Leo*, with a small quantity of ore from the mines. Five practical miners are sent up as workmen. The company expects to work 200 natives during the coming winter, transporting the ore on sledges to the harbor of Golowin bay, 30 miles down Fish river from the mines.

It is only a few weeks since a party left here on a sailing vessel, taking on deck a small stern-wheel steamer. This steamer is to convey the prospectors up the Yukon river, the banks of which they are going to prospect. There are gold diggings in this river several hundred miles from its mouth. The mines of Harrisburg district are now being steadily worked. This summer and next considerable prospecting will be done in Alaska Territory. Each year more interest is manifested in this region, and as more men go up there a larger area will be prospected. If two or three really good mines should be developed, general attention will be directed to Alaska as a mining region.

EUREKA ORE PRODUCT.—From 1873 to January of the present year the gross ore product of Eureka district amounted to about $40,000,000. From 1869, when ore began to be produced in the district, up to 1873, at least $10,000,000 worth of ore was taken out of the various mines then being developed; so that the total gross ore product of Eureka district, from 1869 up to January last, may be set down, within safe limits, at $50,000,000,

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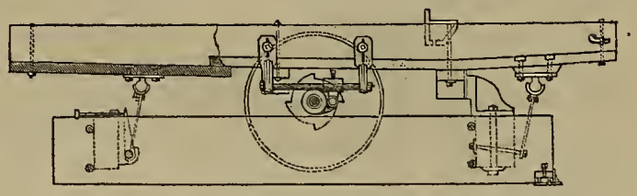

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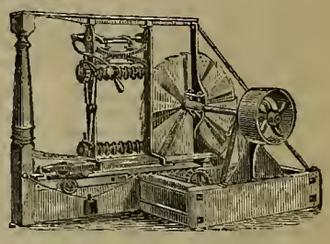

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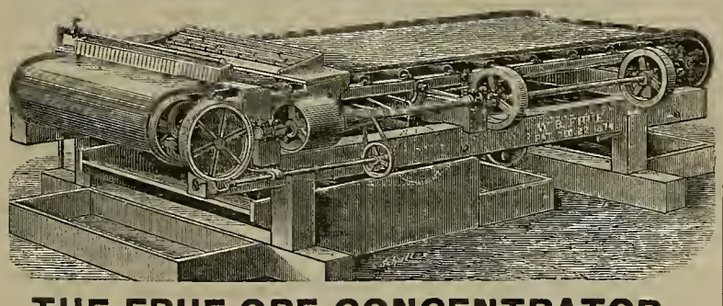

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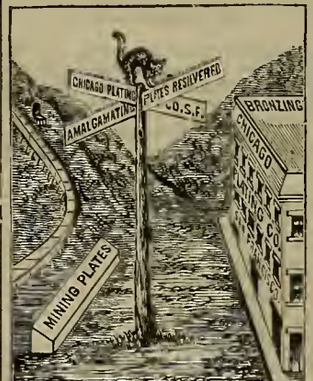

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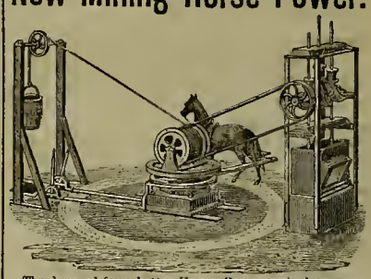

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING JUNE 13 1882.

259,475—ORE FURNACE—Wm. T. Browne, Stockton, Cal.
259,375—MACHINE FOR PULVERIZING ORES—A. L. Fish, San Francisco.
259,394—DEEP WELL PUMP—Wm. Hooker, Oakland, Cal.
259,426—STOP VALVE—Jos. Roylance, S. F.
259,338—COIN TESTER AND INDICATOR—Gilbert Smith and J. J. Wells, S. F.
259,602—CUTTER-BAR FOR MOWING AND REAPING MACHINE—Theo. Taylor, La Grande, Or.
259,605—GRATER—J. D. Todd, Williams, Cal.
259,442—CAN FILLING APPARATUS—Wm. West.
259,443—APPARATUS FOR CRIMPING THE ENDS UPON CIRCULAR CANS, Wm. West.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

WOOD PRESERVING COMPOSITION.—John C. Marshall, Oakland. No. 259,030. Dated June 6, 1882. With this peculiar composition the wood may either be immersed therein, or the the compound may be applied with a brush, when found more convenient. The compound should be applied to the wood while hot. Take, for example, the tire of a wheel which has become loose. It should be raised suitably and allowed to revolve, so that its tire and felly will be immersed in the hot compound, which will penetrate between the wood, and the tire will fit as tightly as before. If applied to the felly, when the tire is first put on, the wood will be prevented from shrinking. This compound is useful for buckets or casks which are to stand in the sun, or have so been exposed for some time. Its previous application will prevent the shrinking or warping of the staves, or its subsequent use takes up shrinkage and makes them tight again. In all cases where wood is liable to shrink or warp, this application is useful in preventing this result, or in remedying it if it has happened. It is also a good preservative for wood, as it will prevent decay.

CAN-FILLING APPARATUS.—William West, Keene, Ontario. This invention relates to that class of apparatus which is employed to pack meat, fish, or other solid substances into cans to be hermetically sealed for the market; and it is an improvement upon an apparatus patented by John West and R. D. Hume, Oct. 19 h, 1880, of which patent the present inventor is sole owner. The present improvements consist in certain details of construction, by which the material is delivered beneath the vertical plunger in a better manner; the operation of the cutting knives is more perfect, and the knives are less liable to become dulled. The mechanism by which the different parts are operated is also improved.

APPARATUS FOR CRIMPING THE ENDS UPON CIRCULAR CANS.—Wm. West, Keene, Ontario, Canada. This is an apparatus for crimping the ends upon cylindrical cans, and for preparing these ends for soldering by applying the acid thereto after being crimped upon the can. The invention consists in certain constructions and combinations of devices for perfecting the operation.

Attend to This.

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A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

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Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Gaudalupe Silver Mining Company—Location of principal place of business, San Francisco, California. Location of Works, Urique, State of Chihuahua, Mexico.

NOTICE—There are delinquent upon the following described stock, on account of assessment No. 28, levied on the 28th day of April, 1882, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Certificate.	No. of Shares.	Amount
Lee, R. B (estate of).....	19	2	$100.00
Steptoe, E. J.....	27	1	50.00
McPherson, J. B. (estate of)	43	1	50.00
Haynes, T. J. (estate of)...	20	2	100.00
Haynes, T. J. (estate of)...	30	1	50.00

And in accordance with law and an order of the Board of Directors, made on the 28th day of April, 1882, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the company, room 13, No. 109 California street, San Francisco, California, on Monday, the Third (3d) day of July, 1882, at the hour of 2 o'clock, P. M., of said day to pay said delinquent assessments thereon, together with the costs of advertising and expenses of the Sale. WM. BLACKWOOD, Sec'y.
OFFICE—Room 13, No. 109 California street, San Francisco, California.

Norwich Gold and Silver Mining Company.

Location of principal place of business, San Francisco, California. Location of Works, Glencoe Mining District, Calaveras County, California.

Notice is hereby given, that at a meeting of the Board Directors, held on the 5th day of June, 1882, an assessment, (No. 1) of Twenty cents (20c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 310 Pine street, room 15, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of July, 1882, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 31st day of July, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. A. L. PERKINS, Sec'y.
Office—310 Pine St., room 15, San Francisco, California.

ASSESSMENT NOTICE.

Gould & Curry Silver Mining Company.

ASSESSMENT, NO. 42.

Levied.....May 23, 1882
Delinquent.....June 29, 1882
Day of Sale.....July 20, 1882
Amount per Share.....Fifty Cents per Share
ALFRED K. DURROW, Secretary.
Office—Room 89, Nevada Block, 309 Montgomery St.

Seaton Gold Mining Company.—Location

of principle place of business, San Francisco. Location of Works, Drytown, Amador County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the sixth day of June, 1882, an assessment, (No. 1) of Fifteen cents (15) per share was levied upon the capital stock of the corporation, payable in U. S. gold coin to the Treasurer, A. Warner, at his office, No. 221 Kearny St., room 2, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Twenty-first day of July, will be delinquent and advertised for sale at public auction; and, unless payment is made before, will be sold on Wednesday, the Sixteenth day of August, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. A. MARTIN, Sec'y.
OFFICE—Room 6, 528 California street, San Francisco, California.

DIVIDEND NOTICE.

OFFICE OF THE

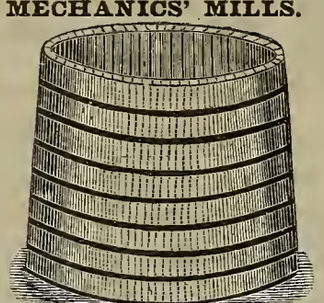
EUREKA CONSOLIDATED MINING CO.

Nevada Block, Room 37, San Francisco, June 15, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 74) of Fifty Cents per share was declared payable on the capital stock of the Company, on Tuesday, the 27th day of June, 1882. Transfer Books closed until the 28th instant.

P. JACOBUS, Secretary pro tem.

MECHANICS' MILLS.



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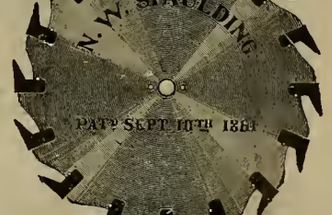

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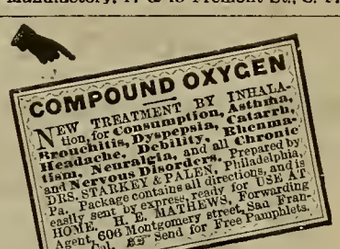
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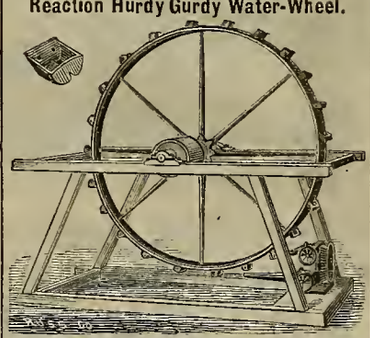

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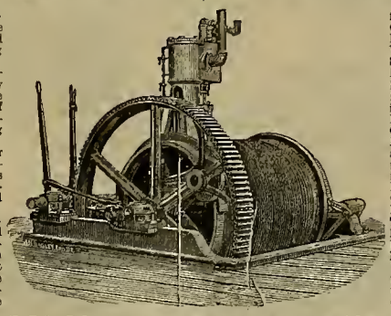

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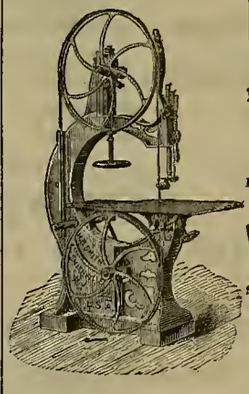

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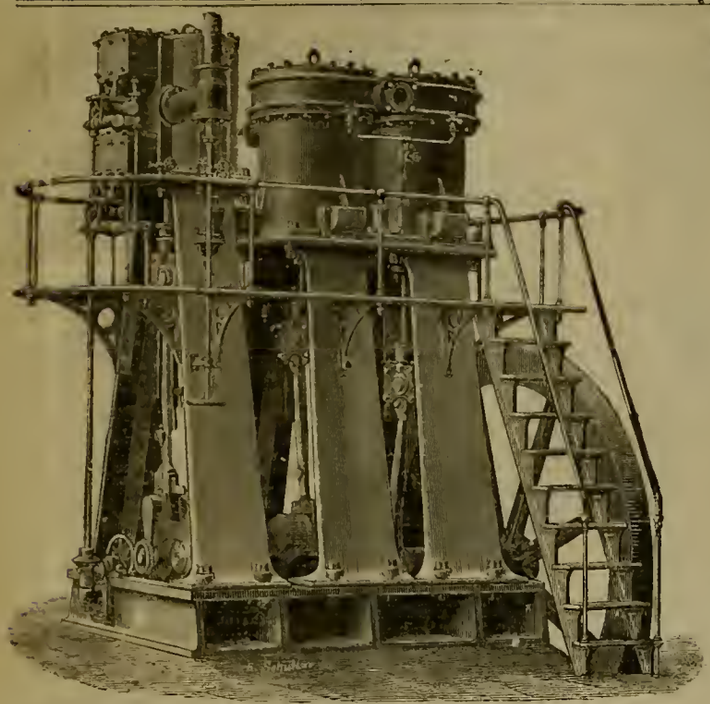

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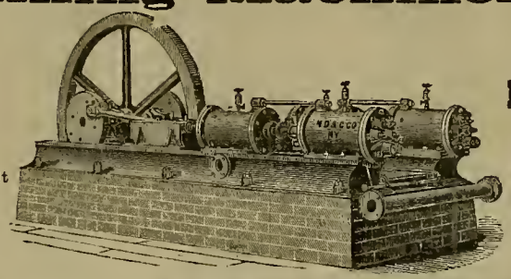

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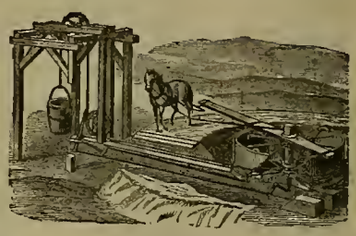

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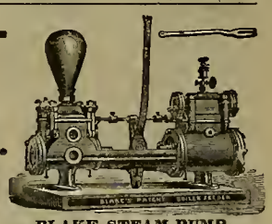

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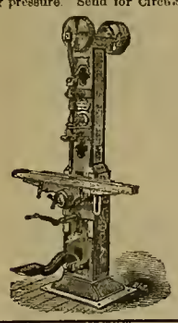

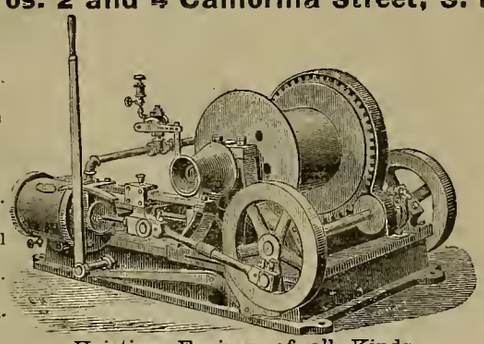

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